

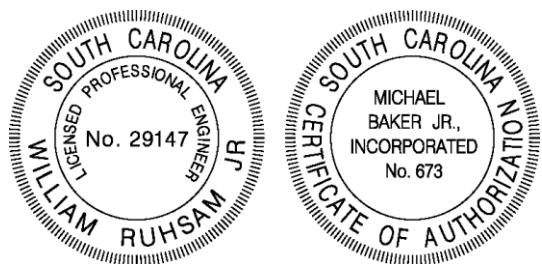
May 2014

TRAFFIC IMPACT STUDY

University SC Tower

COLUMBIA, SOUTH CAROLINA

Prepared For:
Park7 Group



Baker

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EXECUTIVE SUMMARY

The study area is bounded by the Park Street to the west and the Assembly Street to the east, Pendleton Street to the south and Senate Street to the north. The development will consist of a new building containing university residences and retail, as well as internal amenities. Access will be provided on Assembly Street and Park Street.

The study evaluates vehicle and pedestrian traffic at the intersections of Assembly Street, Pendleton Street, Park Street, and Senate Street.

The existing operation of the study area intersections shows sufficient capacity to accommodate existing traffic. Existing pedestrian traffic in the study area is low. Sidewalks are present along all sides of the roadways except for the north side of Pendleton Street. There are no bike lanes present.

A conservative analysis was performed for the proposed development. This analysis included evaluating the development's site generated traffic when placed on the natural background growth of the surrounding traffic. The result of this conservative, worst-case analysis showed an increase in delay and vehicle queues on the studied signalized intersections, however no approach is reduced below a level of service "D".

It can therefore be concluded that, under the “worst case” conditions, the proposed development will have minimal impact on the operation of the existing roadway system.

Since most of the university students making trips during the morning and afternoon peak hours will likely be walking or bicycling, an additional sidewalk on the north side of Pendleton Street should be considered.

INTRODUCTION

The Michael Baker, Jr. Corporation, was retained by the Park7 Group to perform a Traffic Impact Analysis for a development consisting of one building located north of Pendleton Street and south of Senate Street between Park Street to the west and Assembly Street to the east. The proposed development occupies approximately the southern half of the block. The study will examine existing and future vehicular and pedestrian traffic along with the impacts of the proposed development and identify the improvements needed, if any, to mitigate existing or site-generated traffic impacts.

STUDY AREA

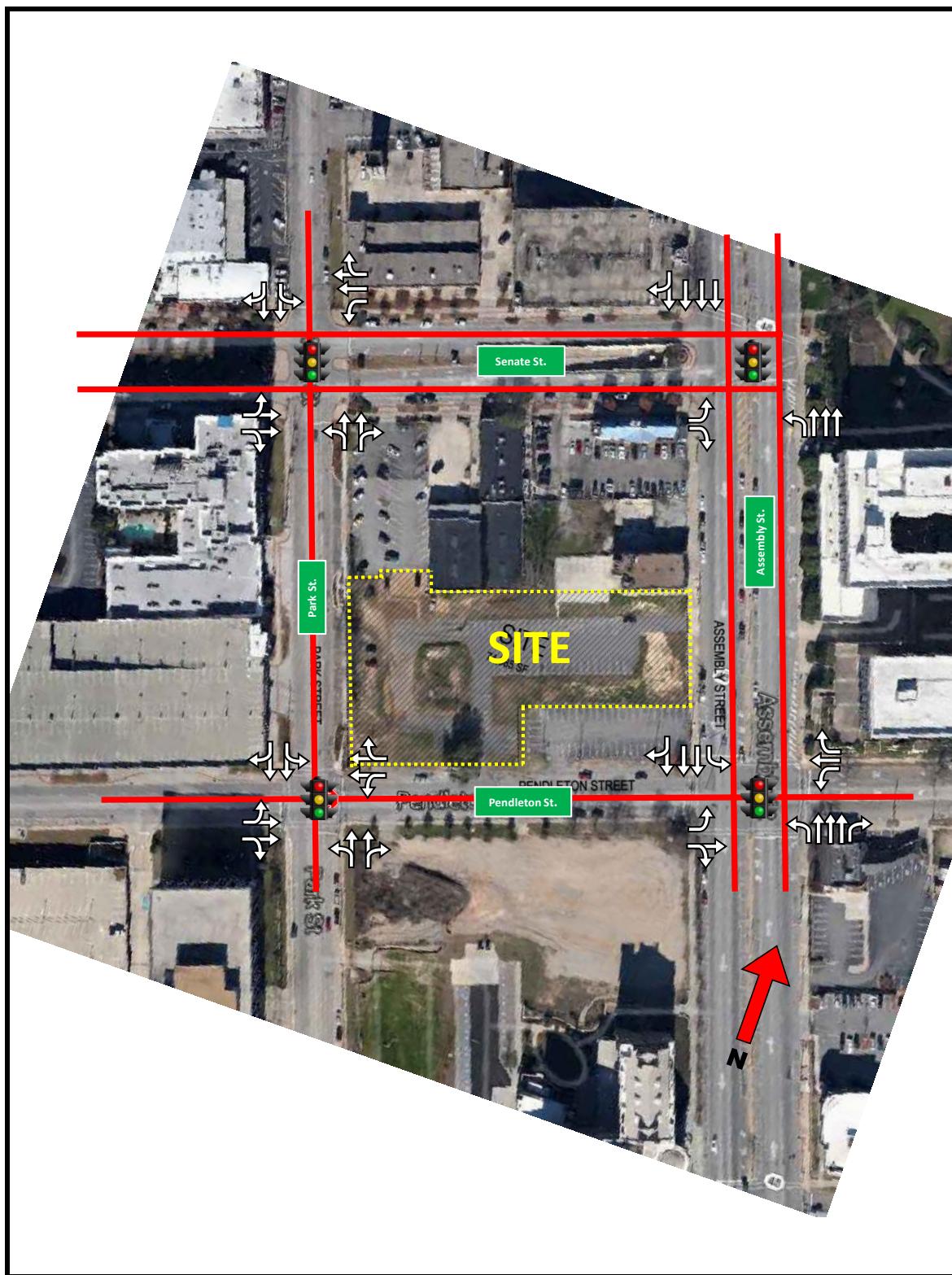
The study area is bounded by the Park Street to the west and the Assembly Street to the east, Pendleton Street to the south and Senate Street to the north. The study area is particularly concerned with the signalized intersections at the intersections of these four roadways. The site location is shown in **Figure 1**.

The site consists of three (3) tax parcels (R08916-09-08, R08916-09-09, R08916-09-10) totaling approximately 1.7 acres. The site is currently zoned C-4 (Central Area Commercial District).

The proposed development will function primarily as residential housing for students attending the University of South Carolina (USC). The development is anticipated to provide 318 housing units in that include one, two, three, four, and five bedroom suites. A total of 708 automobile parking spaces would be provided. The development is anticipated to have an opening year of 2017.

Existing land uses adjacent to the site include a variety of commercial uses north, south, and west of the proposed development with legislative and government offices across Assembly Street to the east.

Figure 1: Site Location



The intersections that will be evaluated in this study consist of the signalized intersections at Park Street and Senate Street, Senate Street at Assembly Street, Assembly Street at Pendleton Street and Pendleton Street at Park Street. Bicycle and pedestrian traffic, particularly that traffic oriented toward USC, will also be evaluated.

EXISTING CONDITIONS

Assembly Street is the eastern border of the study area and consists of a six-lane, median divided arterial with parallel parking both on the outside shoulders and the inside median shoulders. At the intersections with Senate Street and Pendleton Street, dedicated left turns bays are provided with approximately 100 feet of storage for turning vehicles. Assembly Street is a state route, SC 48. The roadway provides arterial access to downtown Columbia, SC, with notable destinations at the South Carolina State House, the University of South Carolina, and other important city locations. In the study area, Assembly Street has a posted speed limit of 30 miles per hour (MPH).

There are no striped bike lanes along Assembly Street. A continuous network of sidewalks is available on both sides of the street in the study area. Recent construction, not reflected in Figure 1, has improved pedestrian access with crosswalk “bump-out” islands at the intersections of Senate Street and Pendleton Street.

Pendleton Street is the southern border of the study area and consists of a four lane, undivided city street with parallel parking on the outside shoulders, adjacent to the curb. At the intersections with Assembly Street and Park Street, the inside lane operates as a shared left/through lane for vehicles moving east and west. The posted speed limit is 30 MPH.

There are no striped bike lanes along Pendleton Street and no sidewalk is available on the north side of the roadway. On the south side of Pendleton Street, a sidewalk is continuous from Assembly Street to Park Street.

Park Street is the western border of the study area and consists of a four lane, undivided city street with parallel parking on the outside shoulder of the eastern edge of the roadway. At the intersections with Pendleton Street and Senate Street, the inside lane operates as a shared left/through lane for vehicles moving east and west. The posted speed limit is 30 MPH.

There are no striped bike lanes along Pendleton Street. Sidewalk is available on the both sides of the roadway and recent streetscape improvements have been implemented along the block.

Senate Street is the northern border of the study area and consists of a four lane, median-divided boulevard with dedicated turn lanes at Pendleton Street. At Assembly Street, Senate Street does not continue east and the east bound lanes are forced to turn left or right based on which lane the vehicle is in. Parallel parking is provided on the outside shoulder of this block. The posted speed limit is 30 MPH.

This block of Senate Street also provides access to underground parking at the State House, with the exit from the parking becoming the dedicated left turn lane onto Park Street providing approximately 150 feet of storage. Continuous sidewalks are provided

along both sides of Senate Street in the study area.

This traffic analysis will focus on the four key intersections where the roadways mentioned intersect and enclose the block containing the proposed development. These intersections are:

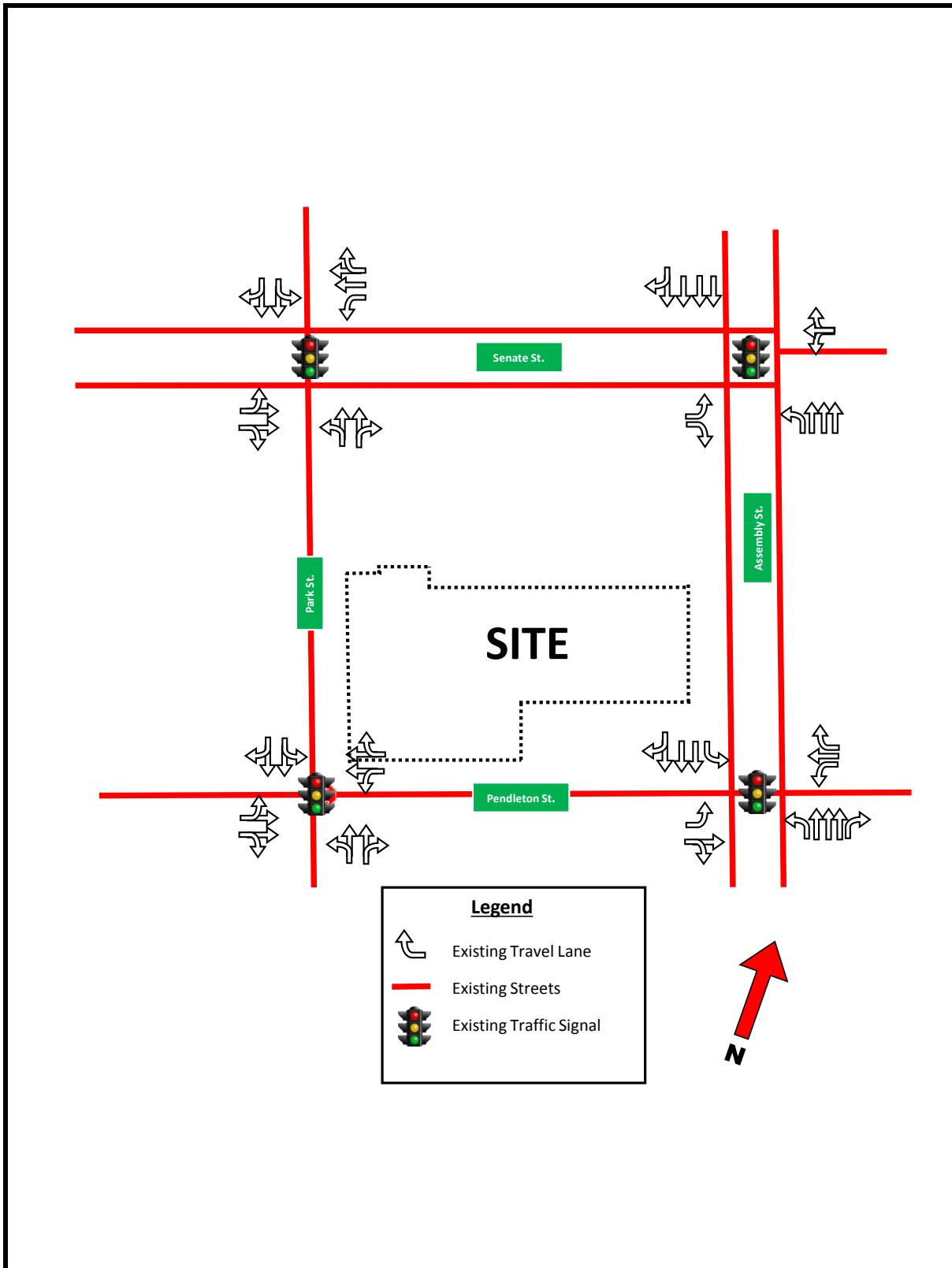
1. Assembly Street at Pendleton Street
2. Pendleton Street at Park Street
3. Park Street at Senate Street
4. Senate Street at Pendleton Street

All four intersections are signalized with two-phase signal control. No dedicated (protected) turn phases are provided for any movement. All signals are provided with pedestrian countdown signal heads and pushbuttons for pedestrian control.

The current site plan shows access provided to Assembly Street and to Park Street for motor vehicles.

Figure 2 depicts the existing lane configuration and traffic control within the study area.

Figure 2: Existing Lane Configuration and Traffic Control



EXISTING TRAFFIC VOLUMES

Existing average annual daily traffic volumes along Pendleton and Park Streets adjacent to the study area and Assembly Street four blocks to the north and south were obtained from the South Carolina Department of Transportation (SCDOT). The 2012 average annual daily traffic (AADT) on Pendleton Street east of Assembly Street was 6,300 vehicles per day (vpd). The 2012 AADT on Assembly Street north of Gervais Street was 22,300 vpd and the AADT on Assembly Street south of Devine Street was 24,000 vpd. The 2012 ADT on Park Street was 3,400 vpd. The annual growth rate over the past five years at the SCDOT traffic count locations has been variable and averages out to a one percent (1%) annual *reduction* in traffic in the study area.

Turning movement counts were performed at the following intersections on Tuesday, April 15, 2014 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM:

- Assembly Street at Pendleton Street
- Pendleton Street at Park Street
- Park Street at Senate Street
- Senate Street at Pendleton Street

The peak hours for the intersections were chosen from the analysis peak hours. The weekday morning peak hour of traffic is between 8:00 AM and 9:00 AM. The afternoon peak hour of traffic was between 5:00 and 6:00 PM. The traffic at each intersection during these hours will be used as the study period for this analysis since they reflect the critical period of traffic flow at the major intersection.

The traffic count data shows mildly directional flows in the study area with an approximate 55%/45% split during the AM and PM peak hours. The exception to this is the northbound traffic on Assembly Street, which is higher throughout the day than the southbound traffic, and there is a significant peak on Senate Street eastbound during the AM peak due to traffic entering the South Carolina State House garage. The majority of this traffic does not exit on Senate Street, instead using the exit that forms the east leg of the Assembly Street/Senate Street intersection. The Assembly Street ADT was measured at 28,677 during the measurement period. This agrees with the SCDOT count stations north and south of the location.

Overall, the traffic data suggests that the area acts in a manner consistent with a central business district pattern, with higher flows during the day and evening, generally equivalent flows in each direction, and no highly specific pattern to turns within the grid network of roadways.

Pedestrian Traffic

Pedestrian traffic is relatively low at the intersections during the peak hours. Most pedestrian traffic was proceeding north and south along Assembly Street and Park Street. Relatively few pedestrians were moving east and west along Senate Street and Pendleton Street.

The 2014 peak hour traffic volumes for vehicle and pedestrian traffic at the study area intersections are shown in **Figure 3** and **Figure 4**.

Figure 3: 2012 Peak Hour Traffic

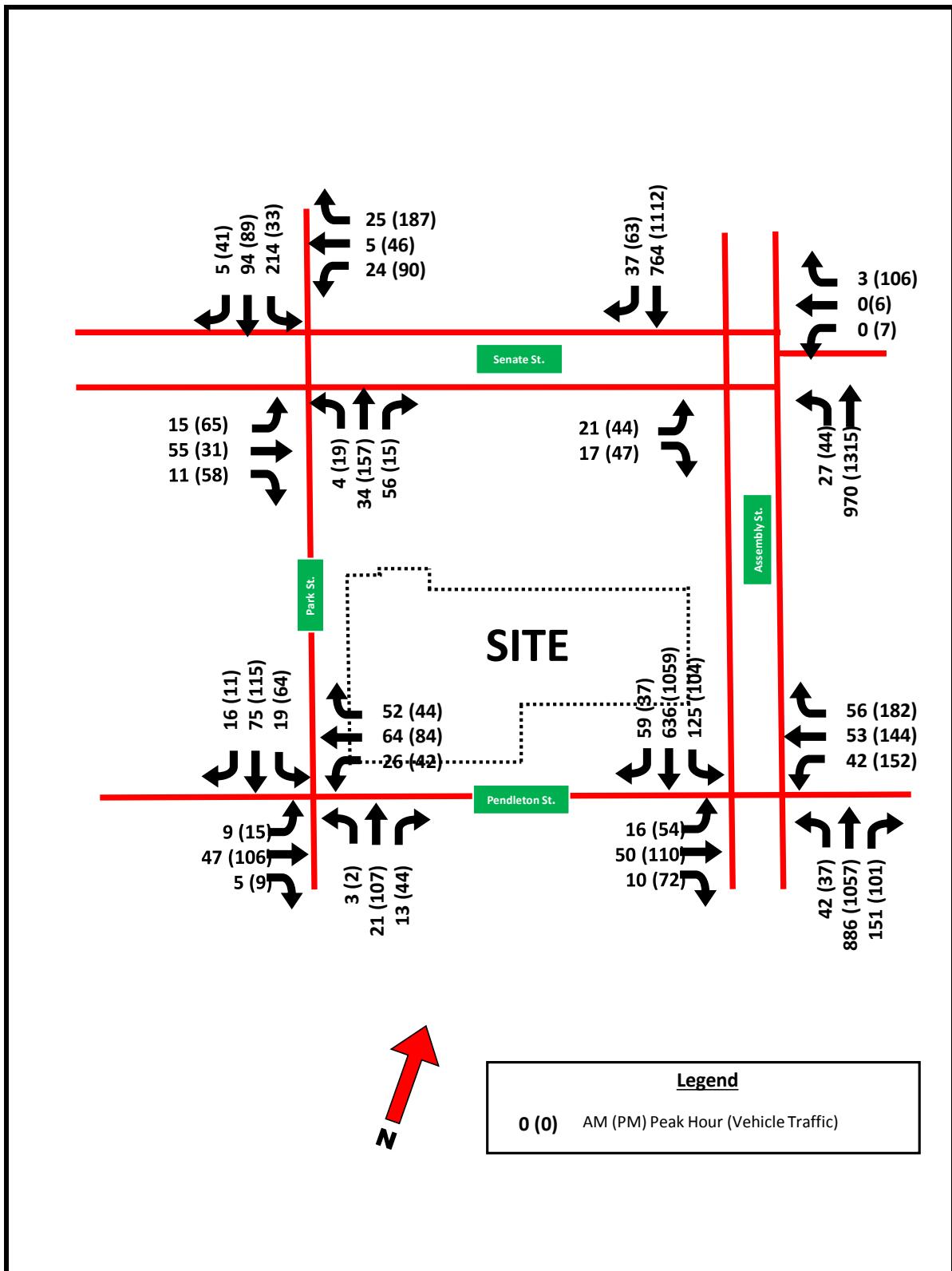
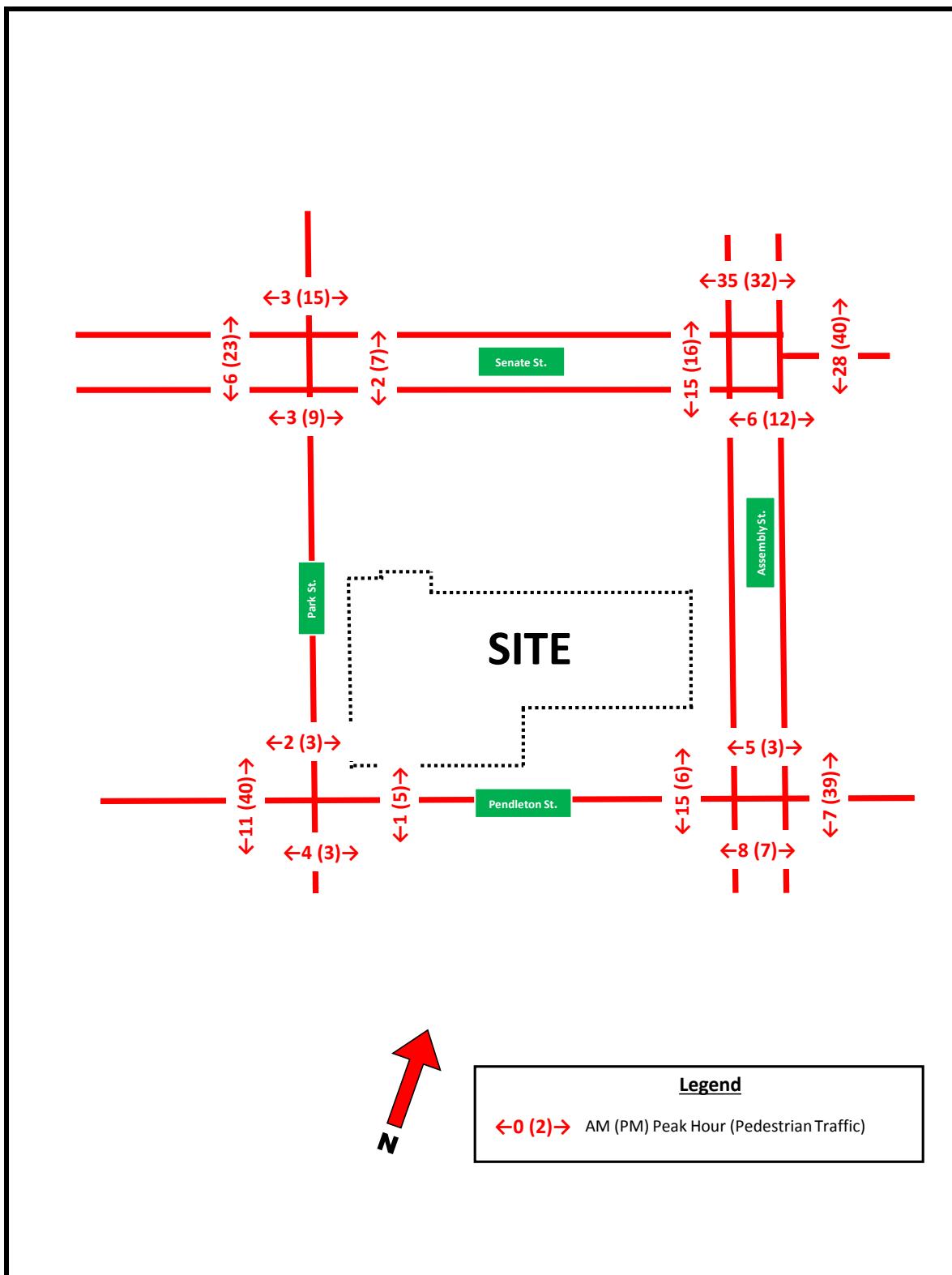


Figure 4: Existing Pedestrian Traffic



TRAFFIC ANALYSIS

Operational analyses were performed for the study area using the Synchro/SimTraffic software using the peak hour traffic volumes shown in **Figure 3**. The Synchro networks incorporate optimized coordinated signal timing for the intersections in the study area.

The Synchro network was modified for this analysis based on field observations and modifications to storage lane lengths. The Synchro network was calibrated based on observed queue lengths at the study area intersections.

Using the existing geometrics and the 2014 peak hour traffic volumes, signalized intersection capacity analyses were performed to determine the existing operational conditions at the study intersections.

SIGNALIZED INTERSECTION ANALYSIS

At a signalized intersection, the total delay is dependent upon a number of factors, including when a driver approaches the intersection, the driver's position in the queue, and the traffic signal cycle length and green times. The control delay for a signalized intersection is determined for each lane group and aggregated for each approach and for the intersection as a whole. Based on these delay values, a "grade" or level of service (LOS) ranging from LOS A, the best, to LOS F, the worst, are assigned. Each LOS represents a range of driver delay. **Table 1** presents the LOS criteria for signalized intersections, which is directly related to the overall intersection control delay value.

The intersection LOS "grades" as defined by the **Transportation Research Board** for signalized intersections are as follows:

Table 1: LOS Criteria for Signalized Intersections

Level of Service	Signalized Intersection Delay (sec/veh)
A	≤ 10.0
B	10.0 to 20.0
C	20.0 to 35.0
D	35.0 to 55.0
E	55.0 to 80.0
F	> 80.0

2014 “EXISTING CONDITIONS” TRAFFIC ANALYSIS

Analyses were performed using the existing 2014 peak hour traffic volumes (Figure 3) and the existing roadway geometrics and traffic control (Figure 2) to identify the existing operational conditions along the intersections within the study area. The results of the analysis of the existing operation are shown in **Table 2**.

Table 2: 2012 Signalized LOS

Intersection	Approach	AM Peak		PM Peak	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Assembly Street and Pendleton Street	Eastbound	19.5	B	24.5	C
	Westbound	18.0	B	28.6	C
	Northbound	6.7	A	14.1	B
	Southbound	12.6	B	32.7	C
Pendleton Street and Park Street	Eastbound	6.8	A	8.3	A
	Westbound	6.2	A	7.7	A
	Northbound	5.1	A	5.3	A
	Southbound	6.6	A	7.1	A
Park Street and Senate Street	Eastbound	16.7	B	13.6	B
	Westbound	12.9	B	13.3	B
	Northbound	3.4	A	7.1	A
	Southbound	6.9	A	5.9	A
Senate Street and Assembly Street	Eastbound	18.0	B	19.6	B
	Westbound	0.0	A	28.8	C
	Northbound	8.3	A	13.5	B
	Southbound	6.7	A	8.9	A

In general, the intersections in the study area are operating well under existing conditions. All of the intersection approaches have a LOS C or better which is generally considered acceptable. The worst approaches are at Assembly Street and Pendleton Street where left turn queuing is adding to intersection delays. Also of note is the westbound approach of Senate Street to Assembly Street which has an LOS C in the PM peak hour. However this is a transient delay due to exiting traffic from the South Carolina State House garage.

FUTURE NON-SITE GENERATED TRAFFIC

Future traffic volumes in the study area will primarily consist of the growth of traffic traveling through the study area due to changes in land use and development. Traffic increases that are generated outside of the study area are typically accounted for by multiplying existing traffic volumes by growth rates determined from ***historic traffic data***. Traffic increases that are generated within the study area by ***other development traffic*** that is planned or under construction are evaluated separately depending on the nature and characteristics of the planned developments and are added to the existing traffic volumes. Analysis is then performed on these additional volumes to establish baseline conditions prior to analyzing and determining the impacts of traffic generated by the proposed development.

Historic Traffic Growth

As mentioned in the section referencing the existing traffic volume data, the annual growth in traffic over the past six years has been variable but the average is a one percent (1.0%) decline, annually. The intention of this traffic impact study is to deliver a conservative estimate of the impacts of a new development, therefore it is generally considered good practice to include positive background traffic growth to account for unforeseen and unknowable economic increases. Based on this, a one and a half percent (1.5%) annual growth rate will be applied through the anticipated 2017 opening year of the development to assess 2017 traffic conditions. This results in an extremely modest increase in background traffic, but avoids the pitfall of projecting a decrease and potentially underestimating traffic growth.

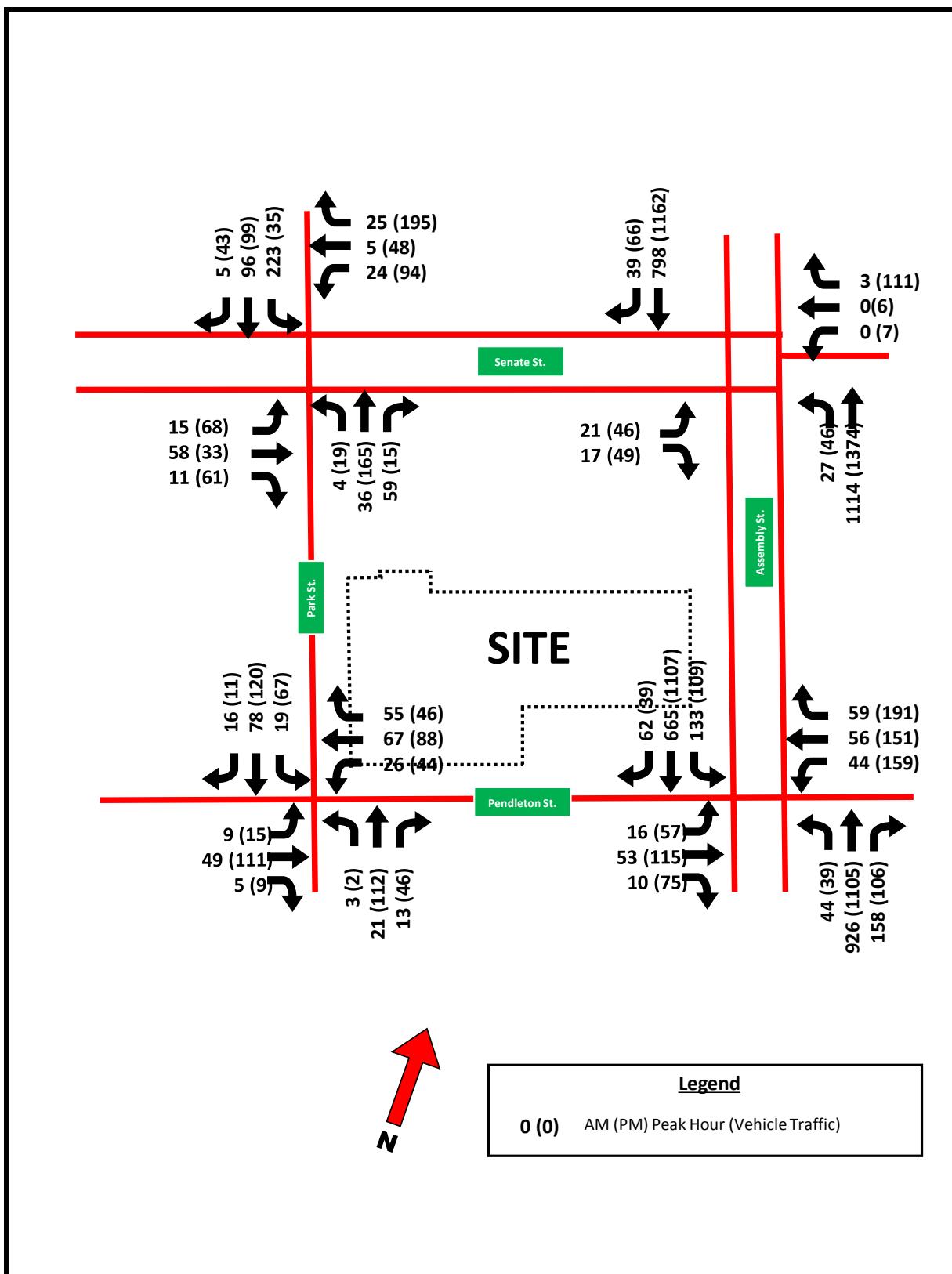
Other Development Traffic

Other developments in the immediate vicinity of the proposed development may also increase the traffic on the adjacent roadway network. For example, the construction of an office building or other commercial building on the block to the south of the study area, across Pendleton Street, would have a portion of its site generated traffic traveling along Pendleton Street and Assembly Street affecting the study area roadway operations. This study is not aware of any proposed development on this city block. The other blocks to the west of the study area are built out and no further development or redevelopment is anticipated within the study time period.

Background Traffic

Based on the Historic Traffic Growth and Other Development Traffic, the 2017 Background Traffic was prepared. This is shown in **Figure 5**. This accounts for all projected traffic growth except that which will be generated by the proposed development.

Figure 5: 2017 Background Traffic



TRIP GENERATION ANALYSIS

A trip generation analysis was performed for the proposed development using the most recent information published by the Institute of Transportation Engineer's (ITE) publication **Trip Generation** (9th Edition). The best proxy for this type of development in an urban setting would be a High Rise Apartment (ITE Land Use Code 222) and Specialty Retail (ITE Land Use Code 826). The results of the trip generation calculation for the proposed development are summarized in **Table 8**.

Table 3: Trip Generation Analysis Results

Land Use	Daily Volume	AM Peak Hour Volume		PM Peak Hour Volume	
		In	Out	In	Out
Residential (318 Dwelling Units)	1455	25	73	70	45
Specialty Retail (14,000 SF)	637	89	96	25	31
	2,092	114	169	95	76

The volumes shown in **Table 3** are the gross expected trips based on the build-out of the proposed development. However, a number of the trips represented in the table will be generated internally (residents using retail). The ITE Trip Generation Manual provides for trip reductions based on internal capture.

For a conservative analysis, the full internal capture recommended by the ITE Trip Generation Manual has not been used. The recommended rates have been reduced by the ratio of retail square footage to residential square footage. This rate reduction encompasses the assumption that while some retail establishments (dining, sundries) will be frequently used by the residents of the proposed development, others most likely will not be on a daily basis. These trip reductions are shown in **Table 4**.

Table 4: Trip Reduction Rates and Volumes

Internal Capture Trip Reduction Rates	Daily	AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
Residential to Retail	11%	0%	0%	16%	16%
Retail to Residential	3%	0%	0%	3%	3%
Volume Reduction					
Residential to Retail	161	0	0	12	8
Retail to Residential	20	0	0	1	1
	181	0	0	13	9

The total off site trips generated due to the combination of the development and the internal capture reductions are shown in **Table 5**.

Table 5: Total Off Site Trips Generated

Land Use	Daily Volume	AM Peak Hour Volume		PM Peak Hour Volume	
		In	Out	In	Out
Residential (324 Dwelling Units)	1,294	25	73	58	37
Specialty Retail (14,000 SF)	617	89	96	24	30
Total	1,911	114	169	82	67

DIRECTIONAL DISTRIBUTION ANALYSIS

The directional distribution for the site generated traffic was estimated by assuming that 90% of the residents in the development would be university students and that a further 85% of trips would be oriented to and from the university during the peak hours.

Based on this distribution, approximately 45% of the distributed trips would be oriented toward university destinations to the east, and 35% oriented to university destinations to the south. A further 15% of trips would be oriented toward the north, and finally 5% would be oriented to the west. The directional distribution of site generated automobile traffic away from the University is summarized in **Table 6**.

Table 6: Directional Distribution of Site Traffic

Direction		
	AM	PM
To/From East	45%	45%
To/From South	35%	35%
To/From North	15%	15%
To/From West	5%	5%
TOTAL	100%	100%

For this analysis, two key assumptions were made. First, that the site would generate traffic comparable to a similarly sized urban high rise mixed-use complex. This in itself is a very conservative assumption since the building will house USC students who are close enough to the school that driving to and from class will be unlikely. Students would walk, bike or ride USC transit (in some combination) instead of drive. Second, the internal capture reductions were themselves reduced in ratio of the retail-to-residential square footage. Using internal normal reduction rates, the trips generated by the proposed development would be higher.

The site generated traffic distribution is shown in **Figure 6**. **Figure 7** shows the 2017 “Build” volumes.

Figure 6: Site Generated Traffic Volumes

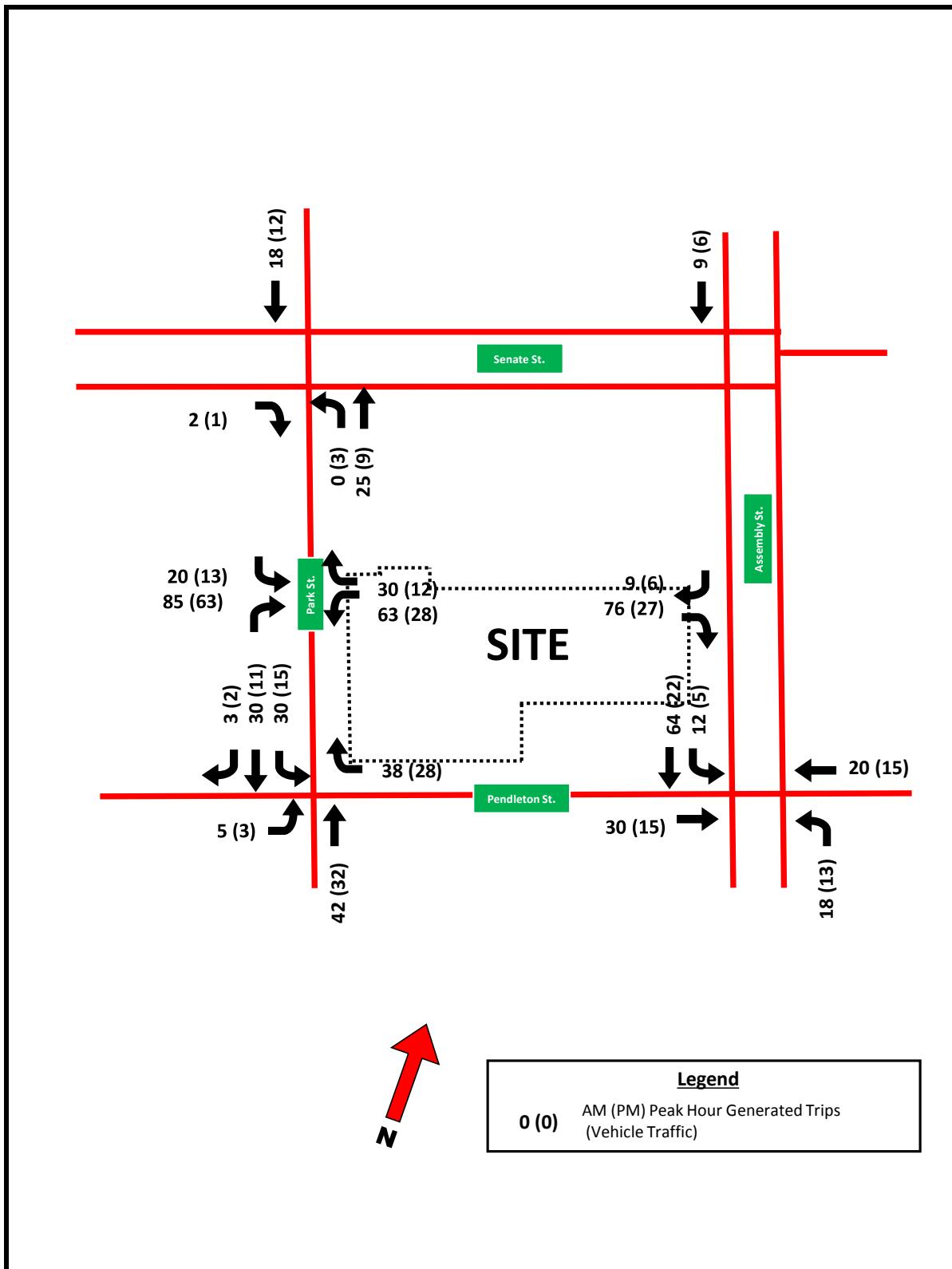
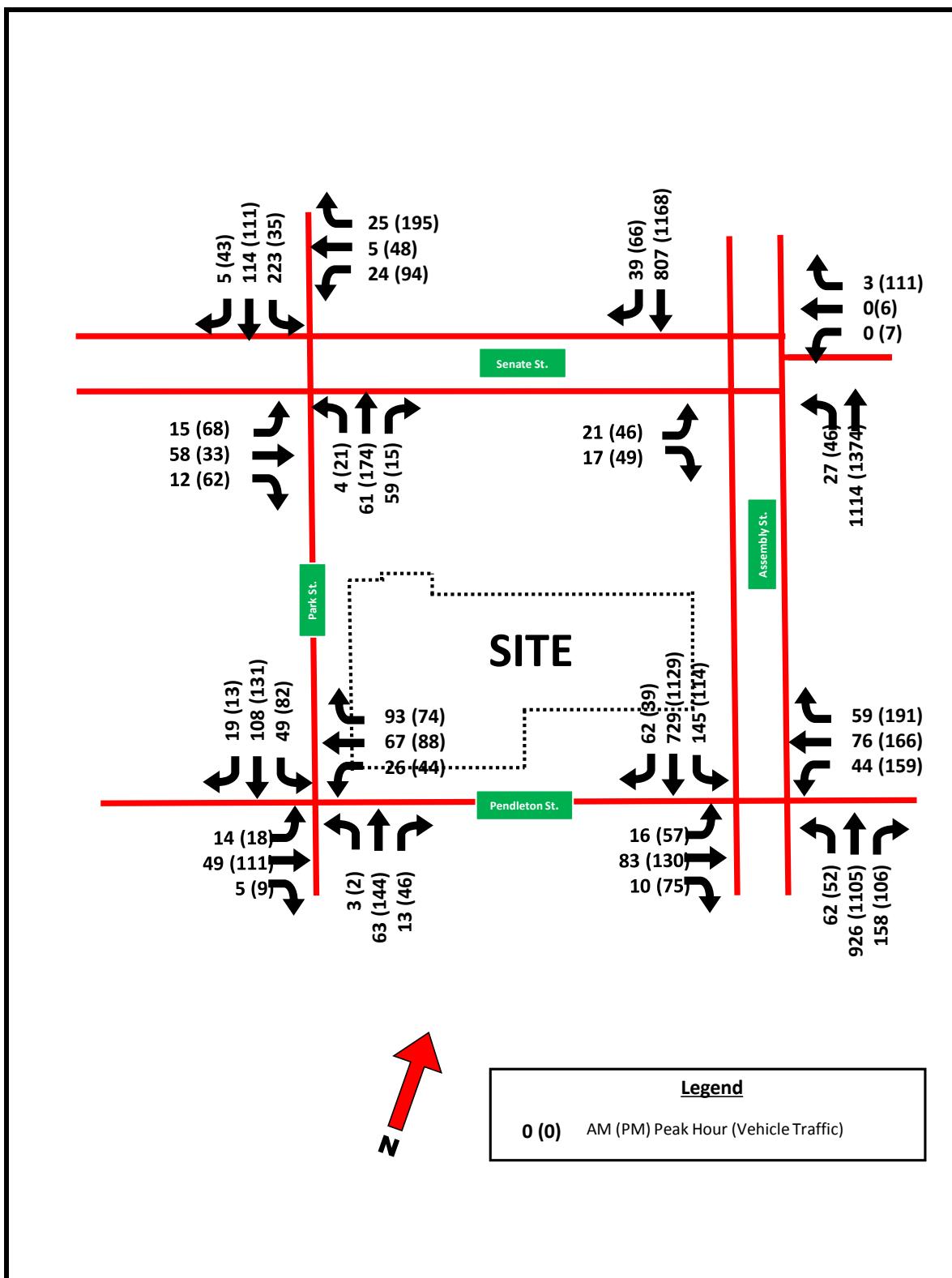


Figure 7: 2017 “Build” Volumes



2017 “OPENING YEAR BUILD” TRAFFIC ANALYSIS

Analyses were performed for the future “Build” condition. The “Build” condition includes the site generated traffic (**Figure 6**) added to the 2017 “No-Build” background traffic volumes, as illustrated in **Figure 5**. These analyses, which are summarized in **Table 7**, used the 2017 “Build” traffic volumes (**Figure 7**) and the existing roadway geometrics (**Figure 2**).

The analysis results indicate that the small additional site traffic should be able to be accommodated at the study area intersections. A modest increase in site traffic on the eastbound approach of Pendleton Street at Assembly Street increases the delay on that approach compared to the 2014 existing conditions analysis. Similarly the small increases in site traffic increase the delay on all of the other intersection approaches that received traffic from the site. The only signalized intersection approach to move from LOS C to LOS D is the southbound Assembly Street at Pendleton Street approach. This is due to a small increase in through and left turning traffic moving southbound which caused the left turn to increase in delay, leading to an approach increase in delay. This delay increase may be self-correcting as any vehicles intending to leave the site and make a southbound left turn on Assembly Street may instead opt to continue south on Assembly Street, or avoid the intersection all together by leaving the development from the Park Street entrance/exit.

The additional traffic generated by the site, while not insignificant, will cause only small increases in delay at all intersections in the study area. However, the resulting delay and LOS represent an unlikely worst case condition, given that few of the residents attending at USC would drive to class, opting instead to walk, bike or take USC transit buses.

Overall, the intersections continue to operate at LOS C during both peak hours with the exception of the southbound approach on Assembly Street to Pendleton Street. Adjustments to the signal timing are likely to reduce the worst of the delay. Based on the analysis results, vehicular traffic during the morning and afternoon peak hours should not be adversely affected by the proposed development.

Table 7: 2017 "Build" Signalized LOS

Intersection	Approach	AM Peak		PM Peak	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Assembly Street and Pendleton Street	Eastbound	23.6	C	25.4	C
	Westbound	18.3	B	31.0	C
	Northbound	7.6	A	16.8	B
	Southbound	21.7	C	41.6	D
Pendleton Street and Park Street	Eastbound	7.1	A	8.6	A
	Westbound	5.5	A	7.3	A
	Northbound	6.4	A	6.4	A
	Southbound	8.0	A	9.6	A
Park Street and Senate Street	Eastbound	16.7	B	13.6	B
	Westbound	12.8	B	13.6	B
	Northbound	3.7	A	7.4	A
	Southbound	7.3	A	6.2	A
Senate Street and Assembly Street	Eastbound	18.0	B	19.8	B
	Westbound	3.0	A	29.6	C
	Northbound	9.1	A	14.5	B
	Southbound	6.8	A	9.3	A

PEDESTRIAN AND BIKE ACCESS

As discussed previously, the location of the proposed University SC development makes it unlikely that residents will drive to class. This raises the question “How *will* residents travel to class?” In all likelihood, residents will use some combination of walking, biking and/or using University Transit services to get to class.

Existing Pedestrian Facilities

Sidewalks exist on all sides of the proposed development with the exception of Pendleton Street.

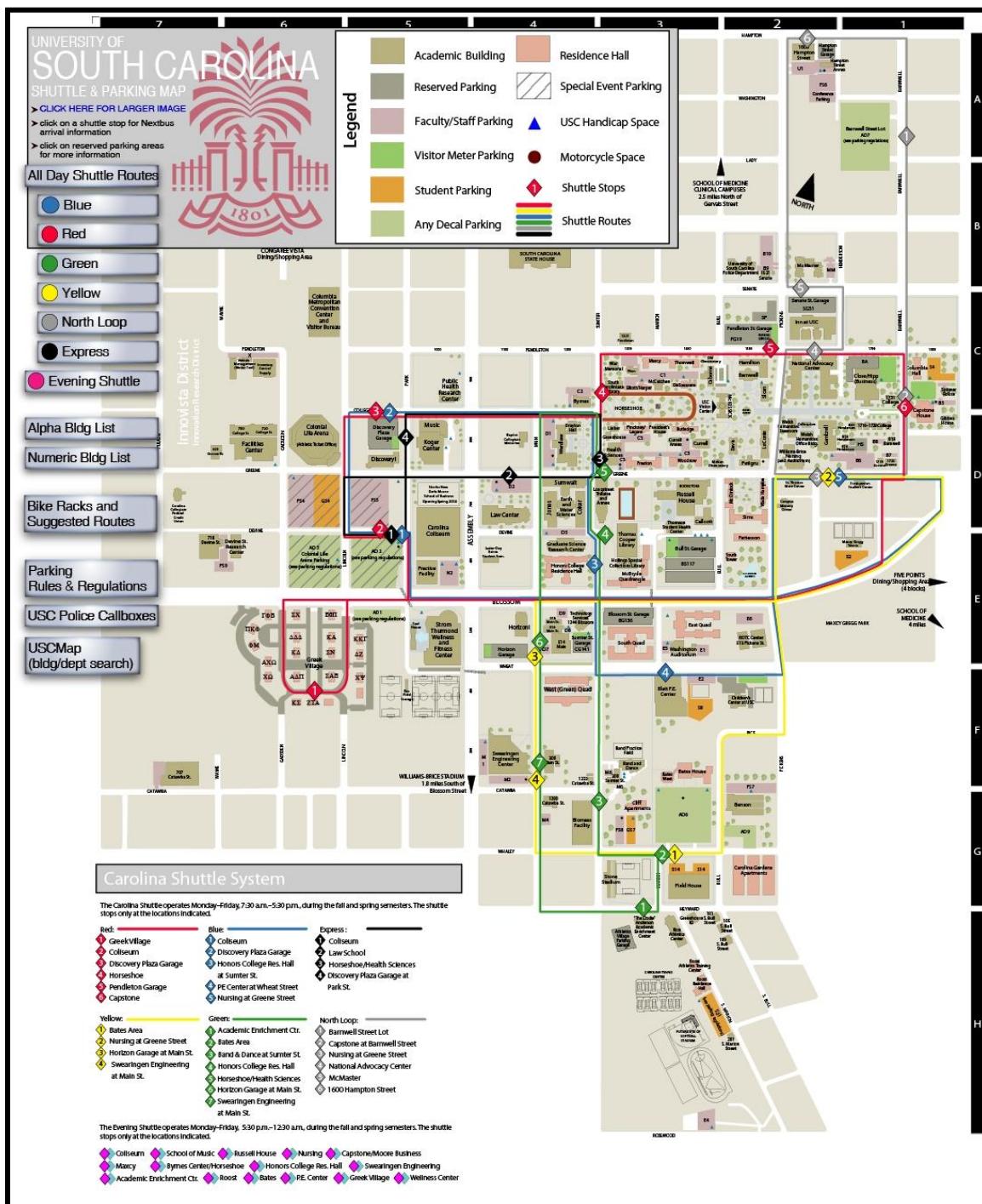
Existing Bicycle Facilities

No bike dedicated lanes are provided through the study area. Bicycle riders share travel lanes with vehicular traffic in the study area.

University Transit Facilities

The University transit system generally does not provide access to the study area. A map of the University shuttle routes is shown in **Figure 8**. Residents of the proposed development would have move south or east to board university transit.

Figure 8: University Shuttle Route Map



CONCLUSIONS

The site's location provides it with a substantial amount of existing roadway access and capacity to serve automobile traffic. Existing peak hour pedestrian and transit traffic in the vicinity of the site is very small. Proposed access to the site via Park Street and Assembly Street provide site traffic with flexible connectivity to the roadway network.

The existing operation of the intersections in the study area show sufficient available capacity. All signalized approaches operate at LOS C or better.

The most recent 10 years of traffic data in the vicinity show that traffic on these roadways has generally been declining. For the purposes of this analysis, we are assuming a conservative one and a half percent annual growth rate in traffic volumes through the projected 2017 opening year.

There are no other developments included as "background traffic" in the 2017 opening year.

The proposed development, if located and functioning as a typical urban high-rise apartment development with retail, would generate 1,911 daily vehicle trips, about 283 morning peak hour trips and about 149 afternoon peak hour trips. However, since the proposed development will provide housing to USC students, it is likely that few of the residents' trips during the morning and afternoon peak hours would be made by automobile. Most of the trips will likely to be made by a combination of walking, bicycling and/or using the University Transit.

To provide a conservative analysis, the proposed development was analyzed as a typical urban high-rise apartment complex with retail and with minimal internal capture to determine the worst case impacts during the morning and afternoon peak hours. Traffic to and from the development was distributed primarily towards the University via the access points. Site traffic oriented away from the University was distributed to the roadway network based on the existing directions of traffic flow through the study area.

With these conservative assumptions, the results of the analysis show the proposed site would cause an increase in delay on most approaches on the studied intersections but only southbound Assembly Street at Pendleton Street would decrease from an LOS C to an LOS D. This decrease in level of service may be mitigated by drivers taking alternate exits and by retiming of signals.

Based on these conservative analyses, it can be concluded that, under the worst case conditions, the proposed development will have minimal impact on the study area roadway network. Because the development will provide student housing, the actual vehicle impacts arising from the proposed development should be less than those estimated in this analysis.

By housing university students, most of the trips to and from the University area will be completed by walking, bicycling and/or using the University bus shuttle. Construction of a sidewalk on Pendleton Street where it does not currently exist should be considered.

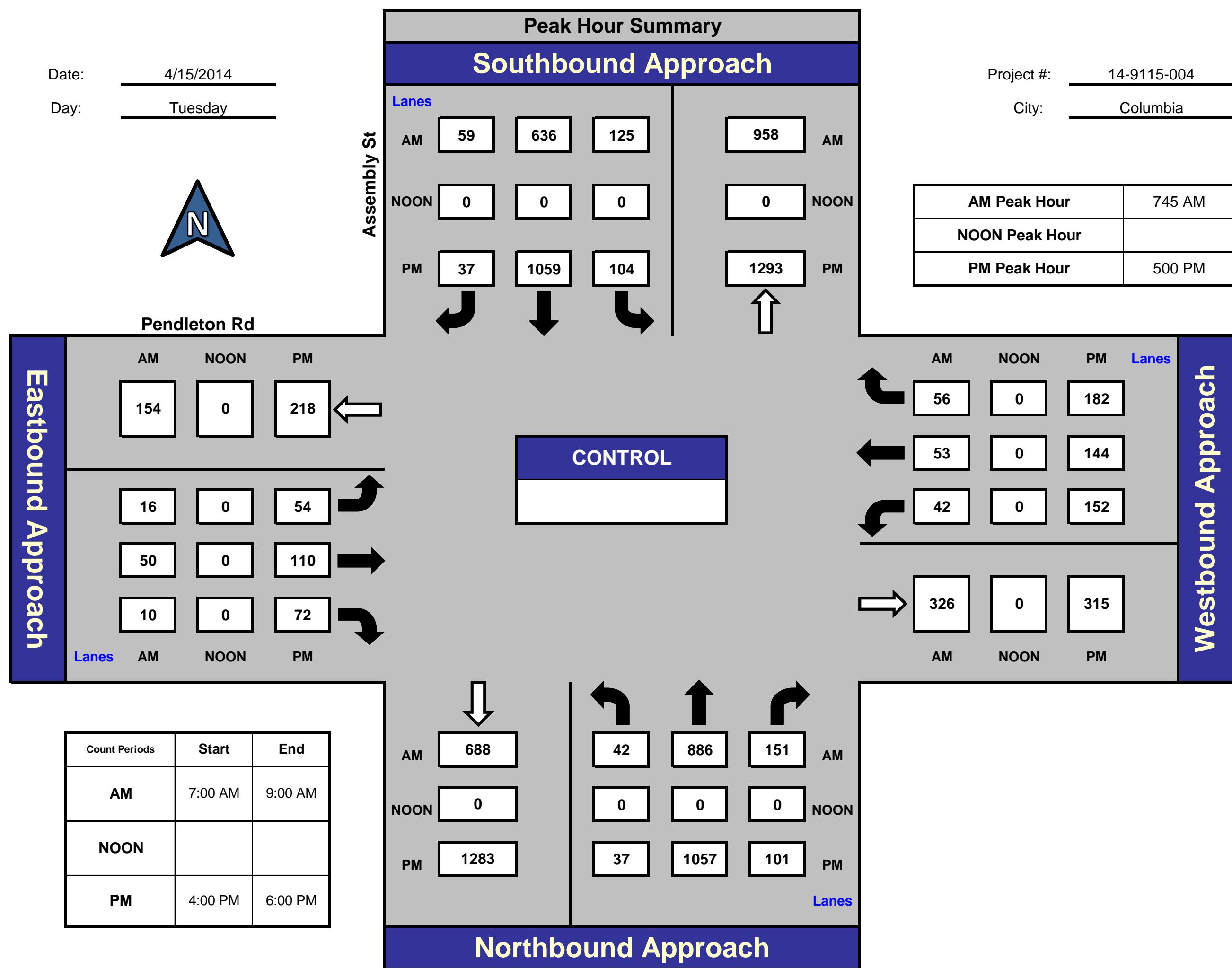
Appendix A Turning Movement Counts

ITM Peak Hour Summary



National Data & Surveying Services

Assembly St and Pendleton Rd, Columbia



Total Ins & Outs

North Leg		
AM	NOON	PM
820	958	
0	0	
1200	1293	
154	0	218
76	0	236
West Leg		
AM	NOON	PM
688	1079	
0	0	
1283	1195	
South Leg		
AM	NOON	PM

Total Volume Per Leg

North Leg		
AM	NOON	PM
1778	0	
2493		
East Leg		
AM	NOON	PM
477	0	793
West Leg		
AM	NOON	PM
1767	0	
2478		
South Leg		
AM	NOON	PM

Project ID: 14-9115-004
 Location: Assembly St & Pendleton Rd
 City: Columbia

Day: Tuesday
 Date: 4/15/2014

Peak Start Times	
AM	7:00 AM
MD	12:00 AM
PM	4:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Assembly St Northbound					Assembly St Southbound					Pendleton Rd Eastbound					Pendleton Rd Westbound					Int. Total
	Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total
7:00 AM	5	88	9	2	102	12	101	4	0	117	3	3	0	3	6	2	1	4	0	7	232
7:15 AM	8	116	9	3	133	15	123	6	0	144	0	2	3	4	5	1	5	2	1	8	290
7:30 AM	1	168	13	3	182	16	129	6	0	151	1	3	0	4	4	6	6	6	1	18	355
7:45 AM	11	196	39	0	246	36	155	4	1	195	7	4	0	3	11	6	10	17	0	33	485
Total	25	568	70	8	663	79	508	20	1	607	11	12	3	14	26	15	22	29	2	66	1362
8:00 AM	8	223	41	1	272	31	163	17	1	211	1	16	3	2	20	9	11	6	2	26	529
8:15 AM	14	233	52	2	299	34	173	19	2	226	6	21	5	6	32	13	17	14	0	44	601
8:30 AM	9	234	19	1	262	24	145	19	1	188	2	9	2	1	13	14	15	19	2	48	511
8:45 AM	2	193	16	2	211	27	151	7	0	185	1	8	2	1	11	9	10	34	3	53	460
Total	33	883	128	6	1044	116	632	62	4	810	10	54	12	10	76	45	53	73	7	171	2101
BREAK																					
4:00 PM	7	272	25	1	304	26	182	8	4	216	10	23	16	1	49	43	28	53	12	124	693
4:15 PM	9	308	23	0	340	22	236	4	1	262	10	13	8	1	31	35	23	51	9	109	742
4:30 PM	8	286	20	2	314	18	230	5	2	253	12	21	8	2	41	40	14	40	10	94	702
4:45 PM	10	265	31	4	306	24	201	3	1	228	5	13	3	2	21	36	24	38	8	98	653
Total	34	1131	99	7	1264	90	849	20	8	959	37	70	35	6	142	154	89	182	39	425	2790
5:00 PM	10	294	10	0	314	29	278	10	3	317	24	30	23	0	77	41	36	65	5	142	850
5:15 PM	7	246	30	0	283	29	269	5	0	303	14	19	13	0	46	41	45	29	4	115	747
5:30 PM	11	264	29	0	304	23	267	14	0	304	11	32	19	0	62	27	32	38	4	97	767
5:45 PM	9	253	32	0	294	23	245	8	0	276	5	29	17	0	51	43	31	50	5	124	745
Total	37	1057	101	0	1195	104	1059	37	3	1200	54	110	72	0	236	152	144	182	18	478	3109
Grand Total	129	3639	398	21	4166	389	3048	139	16	3576	112	246	122	30	480	366	308	466	66	1140	9362
Apprch %	3.1	87.3	9.6	0.5		10.9	85.2	3.9	0.4		23.3	51.3	25.4	6.3		32.1	27.0	40.9	5.8		
Total %	1.4	38.9	4.3	0.2	44.5	4.2	32.6	1.5	0.2	38.2	1.2	2.6	1.3	0.3	5.1	3.9	3.3	5.0	0.7	12.2	
Cars, PU, Vans	129	3618	398	21	4145	389	3017	139	16	3545	112	245	121	30	478	366	307	465	66	1138	9306
% Cars, PU, Vans	100.0	99.4	100.0	100.0	99.5	100.0	99.0	100.0	100.0	99.1	100.0	99.6	99.2	100.0	99.6	100.0	99.7	99.8	100.0	99.8	99.4
Heavy Trucks	0	21	0	0	21	0	31	0	0	31	0	1	1	0	2	0	1	1	0	2	56
%Heavy Trucks	0.0	0.6	0.0	0.0	0.5	0.0	1.0	0.0	0.0	0.9	0.0	0.4	0.8	0.0	0.4	0.0	0.3	0.2	0.0	0.2	0.6

Project ID: 14-9115-004
Location: Assembly St & Pendleton Rd
City: Columbia

PEAK HOURS

Day: Tuesday
Date: 4/15/2014

AM

	Assembly St Northbound				Assembly St Southbound				Pendleton Rd Eastbound				Pendleton Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Tot

Peak Hour Analysis from 07:00 AM to 09:00 AM

Peak Hour for Entire Intersection Begins at 07:45 AM

7:45 AM	11	196	39	246	36	155	4	195	7	4	0	11	6	10	17	33	48
8:00 AM	8	223	41	272	31	163	17	211	1	16	3	20	9	11	6	26	52
8:15 AM	14	233	52	299	34	173	19	226	6	21	5	32	13	17	14	44	60
8:30 AM	9	234	19	262	24	145	19	188	2	9	2	13	14	15	19	48	51
Total Volume	42	886	151	1079	125	636	59	820	16	50	10	76	42	53	56	151	212
% App. Total	3.9	82.1	14.0	100	15.2	77.6	7.2	100	21.1	65.8	13.2	100	27.8	35.1	37.1	100	
PHF		0.902				0.907				0.594				0.786			
Cars, PU, Vans	42	875	151	1068	125	625	59	809	16	50	10	76	42	52	55	149	210
% Cars, PU, Vans	100.0	98.8	100.0	99.0	100.0	98.3	100.0	98.7	100.0	100.0	100.0	100.0	100.0	98.1	98.2	98.7	98.
Heavy Trucks	0	11	0	11	0	11	0	11	0	0	0	0	0	1	1	2	2
%Heavy Trucks	0.0	1.2	0.0	1.0	0.0	1.7	0.0	1.3	0.0	0.0	0.0	0.0	0.0	1.9	1.8	1.3	1.

PM

	Assembly St Northbound				Assembly St Southbound				Pendleton Rd Eastbound				Pendleton Rd Westbound				
Start Time	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Int. Tot.

Peak Hour Analysis from 04:00 PM to 06:00 PM

Peak Hour Analysis from 04:00 PM to 05:00 PM

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT #: 14-9115-004
N/S Street: Assembly St
E/W Street: Pendleton Rd
DATE: 4/15/2014
CITY: Columbia

DAY: Tuesday

AM

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	1	1	0	0	3	0
7:15 AM	0	0	3	0	1	0	1	3
7:30 AM	0	0	2	1	1	0	2	2
7:45 AM	0	1	0	0	0	0	2	1
8:00 AM	1	0	0	1	1	1	1	1
8:15 AM	2	0	1	1	0	0	5	1
8:30 AM	1	0	0	1	1	1	0	1
8:45 AM	0	0	0	2	2	1	0	1
TOTALS	4	1	7	7	6	3	14	10

BIKES

PM

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	1	3	0	1	10	2	0	1
4:15 PM	1	0	0	0	6	3	1	0
4:30 PM	1	1	1	1	8	2	0	2
4:45 PM	0	1	1	3	3	5	1	1
5:00 PM	0	3	0	0	3	2	0	0
5:15 PM	0	0	0	0	4	0	0	0
5:30 PM	0	0	0	0	0	4	0	0
5:45 PM	0	0	0	0	5	0	0	0
TOTALS	3	8	2	5	39	18	2	4

BIKES

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT #: 14-9115-003
N/S Street: Assembly St
E/W Street: Senate St
DATE: 4/15/2014
CITY: Columbia

DAY: Tuesday

AM

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	4	0	0	2	2
7:30 AM	3	0	0	0	1	1	1	1
7:45 AM	2	0	0	0	0	0	0	1
8:00 AM	5	1	0	0	0	1	0	3
8:15 AM	9	1	0	0	2	5	0	0
8:30 AM	8	2	3	0	8	4	0	7
8:45 AM	9	0	3	0	5	3	3	2
TOTALS	36	4	6	4	16	14	6	16

BIKES

PM

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	1	4	0	0	9	1	1	0
4:15 PM	3	4	0	0	3	4	1	2
4:30 PM	2	5	0	2	9	2	4	1
4:45 PM	1	3	0	4	7	3	1	0
5:00 PM	0	11	0	3	4	5	2	4
5:15 PM	0	5	0	3	7	3	0	0
5:30 PM	1	10	0	1	6	2	3	3
5:45 PM	0	5	1	1	8	3	1	3
TOTALS	8	47	1	14	53	23	13	13

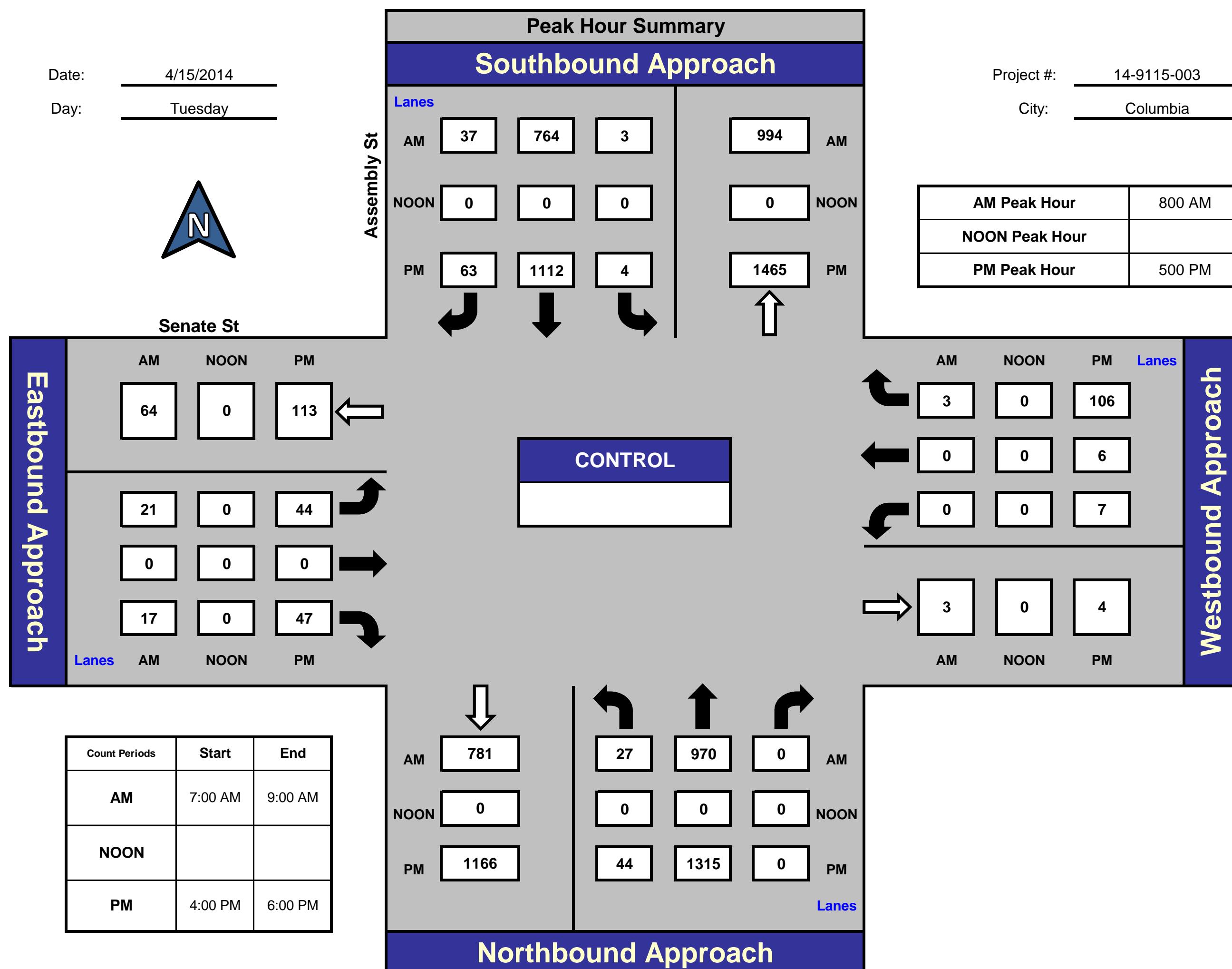
BIKES

ITM Peak Hour Summary



Prepared by:
National Data & Surveying Services

Assembly St and Senate St, Columbia



Total Ins & Outs

North Leg		
AM	NOON	PM
804	994	
0	0	
1179	1465	
64	0	113
38	0	91
West Leg		
AM	NOON	PM
781	997	
0	0	
1166	1359	
South Leg		
AM	NOON	PM

Total Volume Per Leg

North Leg		
AM	NOON	PM
1798	0	
2644		
East Leg		
AM	NOON	PM
102	0	204
West Leg		
AM	NOON	PM
1778	0	
2525		
South Leg		
AM	NOON	PM

Project ID: 14-9115-003
Location: Assembly St & Senate St
City: Columbia

Day: Tuesday
Date: 4/15/2014

Peak Start Times	
AM	7:00 AM
MD	12:00 AM
PM	4:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Assembly St Northbound					Assembly St Southbound					Senate St Eastbound					Senate St Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
7:00 AM	3	100	0	0	103	0	124	5	0	129	2	0	2	0	4	0	0	0	0	0	236
7:15 AM	11	119	0	4	130	0	145	6	0	151	1	0	1	4	2	0	0	0	0	0	283
7:30 AM	8	181	0	0	189	0	157	5	3	162	2	0	2	2	4	0	0	0	2	0	355
7:45 AM	6	193	0	0	199	0	212	5	2	217	1	0	2	1	3	0	0	0	0	0	419
Total	28	593	0	4	621	0	638	21	5	659	6	0	7	7	13	0	0	0	2	0	1293
8:00 AM	4	251	0	0	255	0	183	8	6	191	4	0	5	3	9	0	0	0	1	0	455
8:15 AM	11	222	0	0	233	0	208	7	10	215	3	0	4	0	7	0	0	1	7	1	456
8:30 AM	5	268	0	3	273	2	203	11	10	216	6	0	3	7	9	0	0	1	12	1	499
8:45 AM	7	229	0	3	236	1	170	11	9	182	8	0	5	5	13	0	0	1	8	1	432
Total	27	970	0	6	997	3	764	37	35	804	21	0	17	15	38	0	0	3	28	3	1842

Project ID: 14-9115-003

**Location: Assembly St & Senate St
City: Columbia**

PEAK HOURS

Day: Tuesday
Date: 4/15/2014

AM

	Assembly St Northbound				Assembly St Southbound				Senate St Eastbound				Senate St Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total

Peak Hour Analysis from 07:00 AM to 09:00 AM

Peak Hour for Entire Intersection Begins at 08:00 AM

PM

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-9115-002
N/S Street: Park St
E/W Street: Senate St
DATE: 4/15/2014
CITY: Columbia

DAY: Tuesday

1.

**AM
PFDFESTRIANS**

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	1	0	1	1	0
7:15 AM	1	0	0	0	0	0	3	0
7:30 AM	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	2	0	0	0	0
8:00 AM	0	0	2	0	1	0	2	0
8:15 AM	2	0	0	1	0	1	1	2
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	0	0	1	0
TOTALS	3	1	2	4	1	2	8	3

BIKES

PM

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	0	3	0	0	0	0	2	2
4:15 PM	0	1	0	0	0	0	0	0
4:30 PM	2	1	0	0	4	1	3	0
4:45 PM	0	3	0	1	1	0	0	1
5:00 PM	1	4	0	5	0	0	1	3
5:15 PM	0	5	2	1	4	0	5	2
5:30 PM	1	3	0	0	2	0	5	0
5:45 PM	0	1	0	1	1	0	4	3
TOTALS	4	21	2	8	12	1	20	11

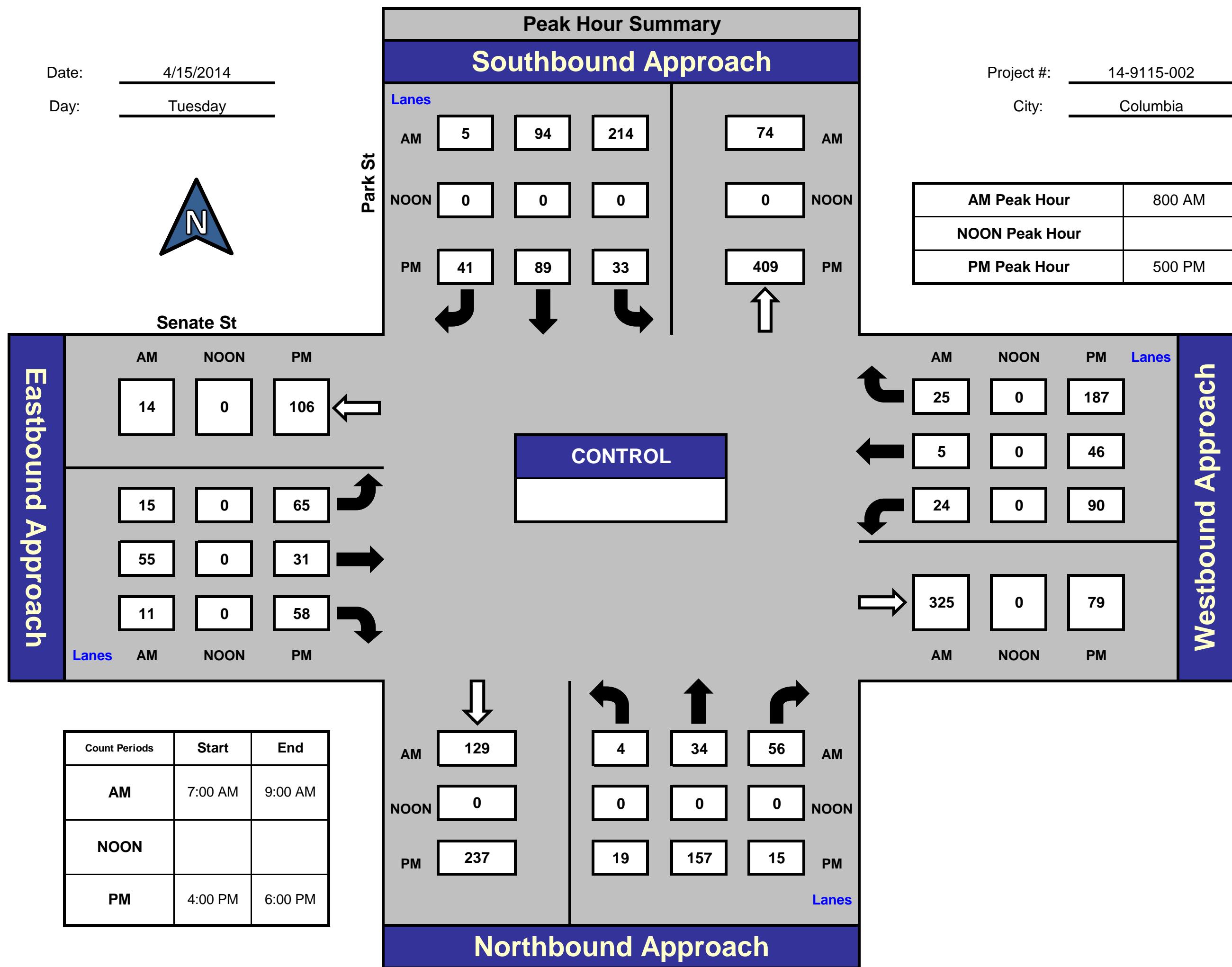
BIKES

ITM Peak Hour Summary



National Data & Surveying Services

Park St and Senate St , Columbia



Total Ins & Outs

			North Leg		
			313	74	AM
			0	0	NOON
			163	409	PM
AM	14	0	106		
NOON	81	0	154		
PM					

			East Leg		
			54	0	323
AM	325	0	79		
NOON					
PM					

			West Leg		
			129	94	AM
			0	0	NOON
			237	191	PM
AM					
NOON					
PM					

			South Leg		
			129	94	AM
			0	0	NOON
			237	191	PM
AM					
NOON					
PM					

Total Volume Per Leg

			North Leg		
			387	0	AM
			572	0	NOON
AM	95	0	260		
NOON					
PM					

			East Leg		
			379	0	AM
			402	0	NOON
AM	223	0			
NOON					
PM					

			West Leg		
			223	0	AM
			428	0	NOON
AM	95	0			
NOON					
PM					

			South Leg		
			223	0	AM
			428	0	NOON
AM	95	0			
NOON					
PM					

Project ID: 14-9115-002
 Location: Park St & Senate St
 City: Columbia

Day: Tuesday
 Date: 4/15/2014

Peak Start Times	
AM	7:00 AM
MD	12:00 AM
PM	4:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Park St Northbound					Park St Southbound					Senate St Eastbound					Senate St Westbound					Int. Total	
	Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	
7:00 AM	0	3	5	1	8	4	24	3	0	31	3	3	2	1	8	1	0	2	1	3	50	
7:15 AM	0	3	3	0	6	13	22	0	1	35	1	1	3	3	5	1	1	1	0	3	49	
7:30 AM	0	4	2	0	6	20	20	1	0	41	1	3	2	1	6	3	1	2	0	6	59	
7:45 AM	2	4	12	2	18	42	24	2	0	68	4	6	3	0	13	3	3	2	0	8	107	
Total		2	14	22	3	38	79	90	6	1	175	9	13	10	5	32	8	5	7	1	20	265
8:00 AM	3	4	17	2	24	44	11	1	0	56	4	6	4	2	14	3	2	4	1	9	103	
8:15 AM	0	7	26	1	33	77	20	0	2	97	2	27	3	3	32	5	0	4	1	9	171	
8:30 AM	0	10	11	0	21	58	38	2	0	98	3	12	2	0	17	5	0	7	0	12	148	
8:45 AM	1	13	2	0	16	35	25	2	1	62	6	10	2	1	18	11	3	10	0	24	120	
Total		4	34	56	3	94	214	94	5	3	313	15	55	11	6	81	24	5	25	2	54	542
BREAK																						
4:00 PM	1	38	2	0	41	1	15	8	3	24	6	8	2	4	16	7	3	35	0	45	126	
4:15 PM	3	33	6	0	42	3	12	6	1	21	4	11	2	0	17	5	11	30	0	46	126	
4:30 PM	1	39	7	0	47	3	19	7	3	29	11	9	1	3	21	18	14	57	5	89	186	
4:45 PM	1	40	4	1	45	2	13	9	3	24	9	5	11	1	25	7	8	31	1	46	140	
Total		6	150	19	1	175	9	59	30	10	98	30	33	16	8	79	37	36	153	6	226	578
5:00 PM	3	40	6	5	49	10	24	7	5	41	9	11	14	4	34	45	16	78	0	139	263	
5:15 PM	4	35	6	3	45	7	23	10	5	40	21	7	12	7	40	20	11	46	4	77	202	
5:30 PM	5	48	2	0	55	8	31	12	4	51	14	7	15	5	36	18	6	44	2	68	210	
5:45 PM	7	34	1	1	42	8	11	12	1	31	21	6	17	7	44	7	13	19	1	39	156	
Total		19	157	15	9	191	33	89	41	15	163	65	31	58	23	154	90	46	187	7	323	831
Grand Total	31	355	112	16	498	335	332	82	29	749	119	132	95	42	346	159	92	372	16	623	2216	
Apprch %	6.2	71.3	22.5	3.2		44.7	44.3	10.9	3.9		34.4	38.2	27.5	12.1		25.5	14.8	59.7	2.6			
Total %	1.4	16.0	5.1	0.7	22.5	15.1	15.0	3.7	1.3	33.8	5.4	6.0	4.3	1.9	15.6	7.2	4.2	16.8	0.7	28.1		
Cars, PU, Vans	30	354	112	16	496	335	330	79	29	744	117	132	95	42	344	159	92	372	16	623	2207	
% Cars, PU, Vans	96.8	99.7	100.0	100.0	99.6	100.0	99.4	96.3	100.0	99.3	98.3	100.0	100.0	100.0	99.4	100.0	100.0	100.0	100.0	100.0	99.6	
Heavy Trucks	1	1	0	0	2	0	2	3	5		2	0	0	0	2	0	0	0	0	0	9	
%Heavy Trucks	3.2	0.3	0.0	0.0	0.4	0.0	0.6	3.7	0.0	0.7	1.7	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.4	

Project ID: 14-9115-002
Location: Park St & Senate S
City: Columbia

PEAK HOURS

Day: Tuesday
Date: 4/15/2014

AM

	Park St Northbound				Park St Southbound				Senate St Eastbound				Senate St Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Tot

Peak Hour Analysis from 07:00 AM to 09:00 AM

Peak Hour for Entire Intersection Begins at 08:00 AM

PM

	Park St Northbound				Park St Southbound				Senate St Eastbound				Senate St Westbound				
Start Time	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Int. Tot.

Peak Hour Analysis from 04:00 PM to 06:00 PM

Peak Hour Analysis from 04:00 PM to 05:00 PM

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 14-9115-001
N/S Street: Park St
E/W Street: Pendleton Rd
DATE: 4/15/2014
CITY: Columbia

DAY: Tuesday

AM

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	2	0	0	0	2
7:30 AM	1	0	0	0	0	0	1	5
7:45 AM	0	0	1	2	0	1	0	2
8:00 AM	1	0	0	1	0	0	0	1
8:15 AM	0	1	0	0	0	1	0	0
8:30 AM	0	0	0	0	0	0	0	3
8:45 AM	0	0	2	0	0	0	0	0
TOTALS	2	1	3	5	0	2	1	14

BIKES

PM

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	0	2	0	3	2	0	5	0
4:15 PM	0	0	0	0	0	0	1	0
4:30 PM	0	1	1	0	3	0	15	0
4:45 PM	0	0	0	2	0	0	1	0
5:00 PM	0	1	0	0	0	0	11	0
5:15 PM	0	0	0	0	0	0	20	0
5:30 PM	0	0	0	0	2	0	8	0
5:45 PM	0	0	0	0	0	0	1	0
TOTALS	0	4	1	5	7	0	62	0

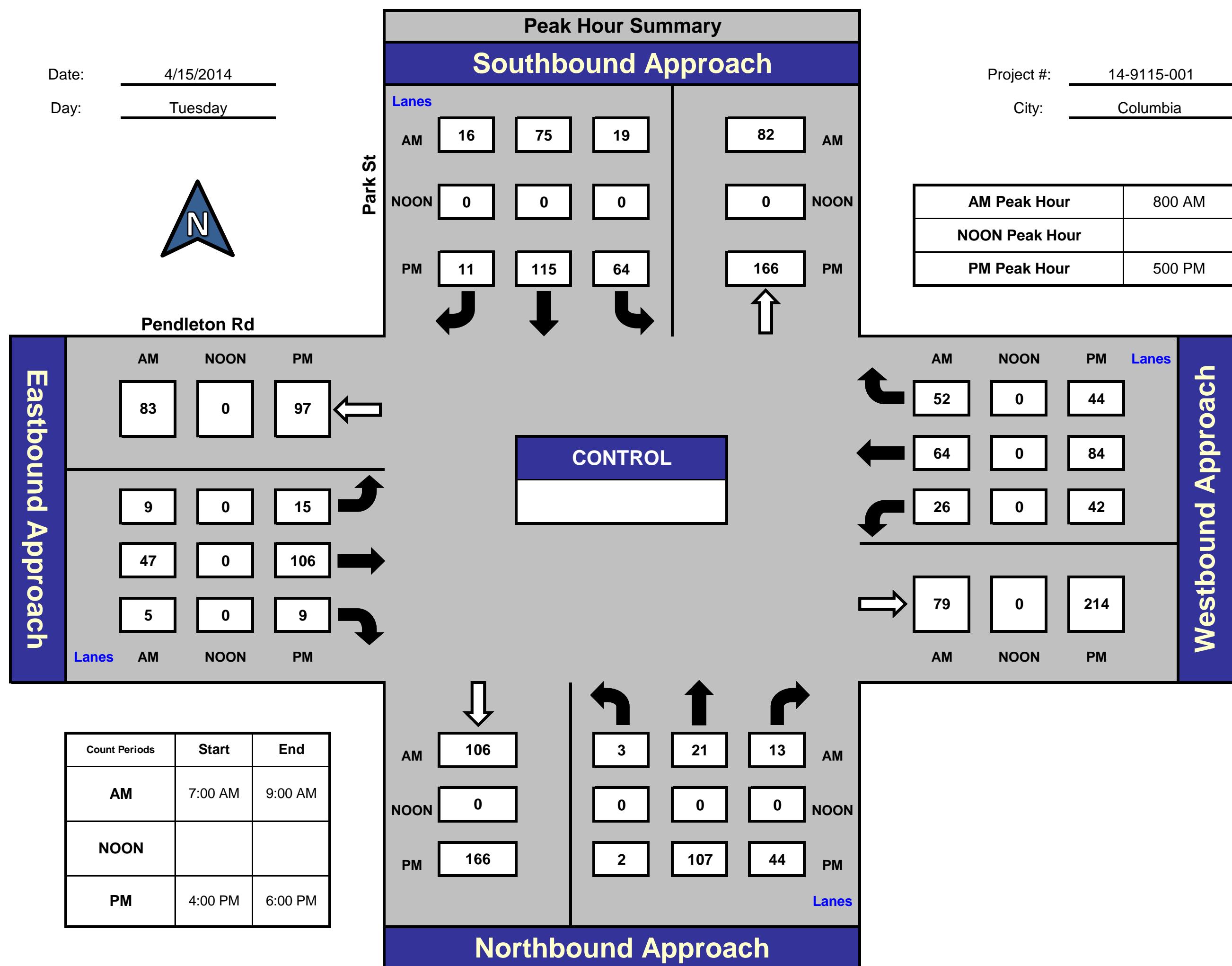
BIKES

ITM Peak Hour Summary



National Data & Surveying Services

Park St and Pendleton Rd , Columbia



Total Ins & Outs

			North Leg		
			AM	NOON	PM
AM	110	82			
NOON	0	0			
PM	190	166			
			East Leg		
			AM	NOON	PM
AM	142	0	170		
NOON	79	0	214		
			West Leg		
			AM	NOON	PM
AM	144	0	227		
NOON	106	37			
PM	0	0			
			South Leg		
			AM	NOON	PM
AM	166	153			
NOON	0	0			
PM	166	153			

Total Volume Per Leg

North Leg			AM
192			
0			
356			
East Leg			NOON
221			
0			
384			
West Leg			PM
143			
0			
319			
South Leg			AM

Project ID: 14-9115-001
 Location: Park St & Pendleton Rd
 City: Columbia

Day: Tuesday
 Date: 4/15/2014

Peak Start Times	
AM	7:00 AM
MD	12:00 AM
PM	4:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Park St Northbound					Park St Southbound					Pendleton Rd Eastbound					Pendleton Rd Westbound					nt. Total	
	Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	
7:00 AM	2	8	1	0	11		0	14	11	0	25	1	5	0	1	6	5	8	1	0	14	56
7:15 AM	4	6	0	2	10		4	15	13	0	32	1	6	1	2	8	3	12	3	0	18	68
7:30 AM	0	6	2	0	8		6	18	9	1	33	1	8	1	6	10	4	9	8	0	21	72
7:45 AM	5	7	0	3	12		6	13	3	0	22	3	6	1	2	10	5	14	10	1	29	73
Total		11	27	3	5	41	16	60	36	1	112	6	25	3	11	34	17	43	22	1	82	269
8:00 AM	2	3	0	1	5		5	15	4	1	24	1	10	0	1	11	6	8	10	0	24	64
8:15 AM	0	8	3	0	11		6	18	5	1	29	4	16	1	0	21	9	21	17	1	47	108
8:30 AM	1	5	7	0	13		4	22	3	0	29	3	11	2	3	16	6	18	19	0	43	101
8:45 AM	0	5	3	2	8		4	20	4	0	28	1	10	2	0	13	5	17	6	0	28	77
Total		3	21	13	3	37	19	75	16	2	110	9	47	5	4	61	26	64	52	1	142	350
BREAK																						
4:00 PM	0	32	10	3	42		5	13	1	2	19	5	26	4	5	35	9	20	6	2	35	131
4:15 PM	0	27	8	0	35		5	11	2	0	18	5	17	0	1	22	8	22	9	0	39	114
4:30 PM	0	27	7	1	34		11	14	3	1	28	7	21	2	15	30	7	10	7	3	24	116
4:45 PM	1	27	3	2	31		7	16	4	0	27	2	11	2	1	15	6	17	13	0	36	109
Total		1	113	28	6	142	28	54	10	3	92	19	75	8	22	102	30	69	35	5	134	470
5:00 PM	1	27	14	0	42		24	38	3	1	65	3	25	2	11	30	15	13	13	0	41	178
5:15 PM	0	25	4	0	29		14	26	3	0	43	1	32	1	20	34	14	32	10	0	56	162
5:30 PM	1	30	18	0	49		17	27	3	0	47	5	24	1	8	30	10	21	12	2	43	169
5:45 PM	0	25	8	0	33		9	24	2	0	35	6	25	5	1	36	3	18	9	0	30	134
Total		2	107	44	0	153	64	115	11	1	190	15	106	9	40	130	42	84	44	2	170	643
Grand Total	17	268	88	14	373		127	304	73	7	504	49	253	25	77	327	115	260	153	9	528	1732
Apprch %	4.6	71.8	23.6	3.8			25.2	60.3	14.5	1.4		15.0	77.4	7.6	23.5		21.8	49.2	29.0	1.7		
Total %	1.0	15.5	5.1	0.8	21.5		7.3	17.6	4.2	0.4	29.1	2.8	14.6	1.4	4.4	18.9	6.6	15.0	8.8	0.5	30.5	
Cars, PU, Vans	17	267	87	14	371		126	304	73	7	503	49	253	25	77	327	115	259	153	9	527	1728
% Cars, PU, Vans	100.0	99.6	98.9	100.0	99.5		99.2	100.0	100.0	100.0	99.8	100.0	100.0	100.0	100.0	100.0	100.0	99.6	100.0	100.0	99.8	99.8
Heavy Trucks	0	1	1		2		1	0	0		1	0	0	0	0	0	0	1	0	1	4	
%Heavy Trucks	0.0	0.4	1.1	0.0	0.5		0.8	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.2	

Project ID: 14-9115-001
Location: Park St & Pendleton Rd
City: Columbia

PEAK HOURS

Day: Tuesday
Date: 4/15/2014

AM

	Park St Northbound				Park St Southbound				Pendleton Rd Eastbound				Pendleton Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total

Peak Hour Analysis from 07:00 AM to 09:00 AM

Peak Hour for Entire Intersection Begins at 08:00 AM

8:00 AM	2	3	0	5	5	15	4	24	1	10	0	11	6	8	10	24	64
8:15 AM	0	8	3	11	6	18	5	29	4	16	1	21	9	21	17	47	108
8:30 AM	1	5	7	13	4	22	3	29	3	11	2	16	6	18	19	43	101
8:45 AM	0	5	3	8	4	20	4	28	1	10	2	13	5	17	6	28	77
Total Volume	3	21	13	37	19	75	16	110	9	47	5	61	26	64	52	142	350
% App. Total	8.1	56.8	35.1	100	17.3	68.2	14.5	100	14.8	77.0	8.2	100	18.3	45.1	36.6	100	
PHF				0.712				0.948				0.726				0.755	
Cars, PU, Vans	3	21	13	37	19	75	16	110	9	47	5	61	26	63	52	141	349
% Cars, PU, Vans	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.4	100.0	99.3	99.7
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.7	0.3

PM

	Park St Northbound				Park St Southbound				Pendleton Rd Eastbound				Pendleton Rd Westbound				
Start Time	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Left	Thru	Rat	App Total	Int. Total

Peak Hour Analysis from 04:00 PM to 06:00 PM

Peak Hour Analysis from 04:00 PM to 05:00 PM

Appendix B

Existing Conditions Capacity Analyses

Lanes, Volumes, Timings
5: Park Street & Pendleton Street

2014 AM Existing Conditions

5/2/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	47	5	26	64	52	3	21	13	19	75	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00			0.99			0.99			1.00	
Fr _t		0.988			0.945			0.946			0.978	
Flt Protected		0.993			0.991			0.996			0.992	
Satd. Flow (prot)	0	3468	0	0	3298	0	0	3319	0	0	3422	0
Flt Permitted		0.880			0.888			0.916			0.895	
Satd. Flow (perm)	0	3073	0	0	2953	0	0	3051	0	0	3087	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		7			75			19			23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		509			544			542			555	
Travel Time (s)		11.6			12.4			12.3			12.6	
Confl. Peds. (#/hr)	2	4	4		2	11		1	1		11	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Adj. Flow (vph)	13	68	7	38	92	75	4	30	19	27	108	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	0	0	205	0	0	53	0	0	158	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	80	391		80	391		80	391		80	391	
Trailing Detector (ft)	50	255		50	255		50	255		50	255	
Detector 1 Position(ft)	50	255		50	255		50	255		50	255	
Detector 1 Size(ft)	30	6		30	6		30	6		30	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA										
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		6	6		2	2	

Lanes, Volumes, Timings
5: Park Street & Pendleton Street

2014 AM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	32.0	32.0		32.0	32.0		33.0	33.0		33.0	33.0	
Total Split (%)	49.2%	49.2%		49.2%	49.2%		50.8%	50.8%		50.8%	50.8%	
Maximum Green (s)	26.0	26.0		26.0	26.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	6.0			6.0			6.0			6.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	4.3			4.3			6.2			6.2		
Actuated g/C Ratio	0.19			0.19			0.27			0.27		
v/c Ratio	0.15			0.34			0.06			0.19		
Control Delay	6.8			6.2			5.1			6.6		
Queue Delay	0.0			0.0			0.0			0.0		
Total Delay	6.8			6.2			5.1			6.6		
LOS	A			A			A			A		
Approach Delay	6.8			6.2			5.1			6.6		
Approach LOS	A			A			A			A		

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 23.1

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.34

Intersection Signal Delay: 6.3

Intersection LOS: A

Intersection Capacity Utilization 32.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 5: Park Street & Pendleton Street



Lanes, Volumes, Timings
6: Assembly Street & Pendleton Street

2014 AM Existing Conditions

5/2/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	50	10	42	53	56	42	886	151	125	636	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	12	12	12
Storage Length (ft)	0		0	0		285	100		0	100		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor	1.00	1.00		0.99		0.98	1.00		0.97	1.00	1.00	
Fr _t		0.976				0.850			0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	1372	0	1540	1621	1378	1540	4424	1198	1593	4312	0
Flt Permitted	0.707			0.701			0.273			0.200		
Satd. Flow (perm)	1142	1372	0	1129	1621	1355	441	4424	1162	335	4312	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				50			218		30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		544			540			535			555	
Travel Time (s)		12.4			12.3			12.2			12.6	
Confl. Peds. (#/hr)	5		8	8		5	15		7	7		15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)		6	6						6		6	6
Adj. Flow (vph)	23	72	14	61	77	81	61	1280	218	181	919	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	86	0	61	77	81	61	1280	218	181	1004	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.42	1.19	1.19	1.19	1.19	1.19	1.19	1.42	1.14	1.21	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	80	391		80	391	20	80	391	20	80	391	
Trailing Detector (ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Position(ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Size(ft)	30	6		30	6	20	30	6	20	30	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex								
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: Assembly Street & Pendleton Street

2014 AM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	30.0	30.0		30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	
Total Split (s)	30.0	30.0		30.0	30.0	30.0	35.0	35.0	35.0	35.0	35.0	
Total Split (%)	46.2%	46.2%		46.2%	46.2%	46.2%	53.8%	53.8%	53.8%	53.8%	53.8%	
Maximum Green (s)	24.0	24.0		24.0	24.0	24.0	29.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	Min	Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	16.0	16.0	16.0	16.0	16.0	
Pedestrian Calls (#/hr)	15	15		15	15	15	15	15	15	15	15	
Act Effect Green (s)	7.8	7.8		7.8	7.8	7.8	33.8	33.8	33.8	33.8	33.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15	0.67	0.67	0.67	0.67	0.67	
v/c Ratio	0.13	0.38		0.35	0.31	0.32	0.21	0.43	0.26	0.81	0.35	
Control Delay	17.7	20.0		22.8	20.3	12.2	10.0	7.2	2.5	46.9	6.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.7	20.0		22.8	20.3	12.2	10.0	7.2	2.5	46.9	6.4	
LOS	B	C		C	C	B	B	A	A	D	A	
Approach Delay		19.5			18.0			6.7			12.6	
Approach LOS		B			B			A			B	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 50.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 61.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Assembly Street & Pendleton Street



Lanes, Volumes, Timings
9: Park Street & Senate Street

2014 AM Existing Conditions

5/2/2014

	↑	→	↓	↗	↖	↙	↖	↗	↑	↗	↖	↙	↓	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Volume (vph)	15	55	11	24	5	25	4	34	56	214	94	5		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11		
Storage Length (ft)	0		0	150		0	0		0	0	0	0		
Storage Lanes	0		0	1		0	0		0	0	0	0		
Taper Length (ft)	100			100			100			100				
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Ped Bike Factor				1.00		1.00						1.00		
Fr _t				0.979			0.874			0.911		0.998		
Flt Protected				0.991		0.950				0.998		0.967		
Satd. Flow (prot)	0	2787	0	1540	2485	0	0	2596	0	0	2778	0		
Flt Permitted				0.892		0.678			0.938			0.712		
Satd. Flow (perm)	0	2508	0	1096	2485	0	0	2439	0	0	2043	0		
Right Turn on Red				Yes			Yes			Yes		Yes		
Satd. Flow (RTOR)		16			36			81			3			
Link Speed (mph)		30			30			30			30			
Link Distance (ft)		522			541			555			543			
Travel Time (s)		11.9			12.3			12.6			12.3			
Confl. Peds. (#/hr)	3		3	3		3	6		2	2		6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90		
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%		
Parking (#/hr)		6	6		6	6		6	6		6	6		
Adj. Flow (vph)	22	79	16	35	7	36	6	49	81	309	136	7		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	117	0	35	43	0	0	136	0	0	452	0		
Enter Blocked Intersection	No													
Lane Alignment	Left	Left	Right											
Median Width(ft)		11			11			0			0			
Link Offset(ft)		0			0			0			0			
Crosswalk Width(ft)		10			10			10			10			
Two way Left Turn Lane														
Headway Factor	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19		
Turning Speed (mph)	15		9	15		9	15		9	15		9		
Number of Detectors	1	2		1	2		1	2		1	2			
Detector Template	Left	Thru												
Leading Detector (ft)	80	391		80	391		80	391		80	391			
Trailing Detector (ft)	50	255		50	255		50	255		50	255			
Detector 1 Position(ft)	50	255		50	255		50	255		50	255			
Detector 1 Size(ft)	30	6		30	6		30	6		30	6			
Detector 1 Type	Cl+Ex	Cl+Ex												
Detector 1 Channel														
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 2 Position(ft)		385			385			385			385			
Detector 2 Size(ft)		6			6			6			6			
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex			
Detector 2 Channel														

Lanes, Volumes, Timings
9: Park Street & Senate Street

2014 AM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	33.0	33.0		33.0	33.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.8%	50.8%		50.8%	50.8%		49.2%	49.2%		49.2%	49.2%	
Maximum Green (s)	27.0	27.0		27.0	27.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0			0.0			0.0		
Total Lost Time (s)	6.0		6.0	6.0			6.0			6.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	15	15		15	15		18	18		18	18	
Act Effect Green (s)	6.8		6.8	6.8			31.5			31.5		
Actuated g/C Ratio	0.14		0.14	0.14			0.67			0.67		
v/c Ratio	0.31		0.22	0.11			0.08			0.33		
Control Delay	16.7		19.2	7.7			3.4			6.9		
Queue Delay	0.0		0.0	0.0			0.0			0.0		
Total Delay	16.7		19.2	7.7			3.4			6.9		
LOS	B		B	A			A			A		
Approach Delay	16.7			12.9			3.4			6.9		
Approach LOS		B		B			A			A		

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 47.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.33

Intersection Signal Delay: 8.4

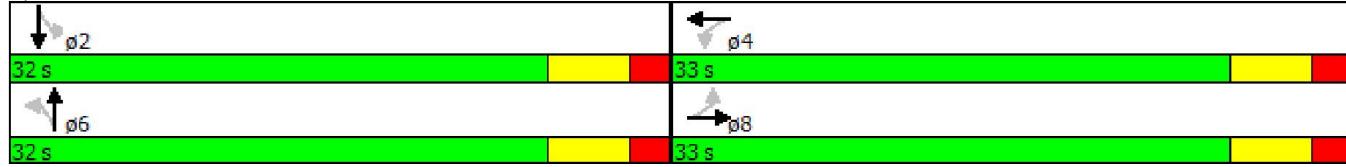
Intersection LOS: A

Intersection Capacity Utilization 43.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 9: Park Street & Senate Street



Lanes, Volumes, Timings
11: Assembly Street & Senate Street

2014 AM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	0	17	0	0	3	27	970	0	0	764	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	1		1	0		0	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor	0.97		0.98		0.96		1.00				1.00	
Fr _t			0.850		0.865						0.993	
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1540	0	1198	0	1346	0	1386	4577	0	0	5534	0
Flt Permitted	0.755						0.217					
Satd. Flow (perm)	1189	0	1178	0	1346	0	316	4577	0	0	5534	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			50		50						19	
Link Speed (mph)			30			30			30			30
Link Distance (ft)			541			401			555			534
Travel Time (s)			12.3			9.1			12.6			12.1
Confl. Peds. (#/hr)	35		6	6		35	15					15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)			6	6			6				6	6
Adj. Flow (vph)	30	0	25	0	0	4	39	1401	0	0	1104	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	0	25	0	4	0	39	1401	0	0	1157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)			22		22			12				12
Link Offset(ft)			0		0			0				0
Crosswalk Width(ft)			10		10			10				10
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.42	1.19	1.19	1.19	1.36	1.14	1.14	1.14	1.19	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2		1	2				2
Detector Template	Left		Right	Left	Thru		Left	Thru				Thru
Leading Detector (ft)	80		20	80	391		80	391				391
Trailing Detector (ft)	50		0	50	255		50	255				255
Detector 1 Position(ft)	50		0	50	255		50	255				255
Detector 1 Size(ft)	30		20	30	6		30	6				6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		0.0	0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		0.0	0.0				0.0
Detector 2 Position(ft)					385		385					385
Detector 2 Size(ft)					6		6					6
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
11: Assembly Street & Senate Street

2014 AM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Perm		Perm		NA		Perm	NA			NA	
Protected Phases					4			6			2	
Permitted Phases	8		8	4			6					
Detector Phase	8		8	4	4		6	6			2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
Minimum Split (s)	30.0		30.0	30.0	30.0		26.0	26.0			26.0	
Total Split (s)	30.0		30.0	30.0	30.0		35.0	35.0			35.0	
Total Split (%)	46.2%		46.2%	46.2%	46.2%		53.8%	53.8%			53.8%	
Maximum Green (s)	24.0		24.0	24.0	24.0		29.0	29.0			29.0	
Yellow Time (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0		6.0	6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	Min		Min	Min	Min		Max	Max			Max	
Walk Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Flash Dont Walk (s)	19.0		19.0	19.0	19.0		15.0	15.0			15.0	
Pedestrian Calls (#/hr)	15		15	15	15		15	15			15	
Act Effect Green (s)	8.2		8.2	8.2	8.2		29.6	29.6			29.6	
Actuated g/C Ratio	0.16		0.16		0.16		0.59	0.59			0.59	
v/c Ratio	0.15		0.11		0.02		0.21	0.52			0.35	
Control Delay	18.0		3.0		0.0		11.4	8.3			6.7	
Queue Delay	0.0		0.0		0.0		0.0	0.0			0.0	
Total Delay	18.0		3.0		0.0		11.4	8.3			6.7	
LOS	B		A		A		B	A			A	
Approach Delay					0.0			8.3			6.7	
Approach LOS					A			A			A	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 50

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 7.7

Intersection LOS: A

Intersection Capacity Utilization 53.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Assembly Street & Senate Street



Lanes, Volumes, Timings
5: Park Street & Pendleton Street

2014 PM Existing Conditions

5/2/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	106	9	42	84	44	2	107	44	64	115	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.990				0.961			0.957		0.991	
Flt Protected		0.994				0.988			0.999		0.983	
Satd. Flow (prot)	0	3479	0	0	3347	0	0	3367	0	0	3438	0
Flt Permitted		0.890				0.848			0.946		0.793	
Satd. Flow (perm)	0	3114	0	0	2871	0	0	3187	0	0	2770	0
Right Turn on Red			Yes				Yes			Yes		Yes
Satd. Flow (RTOR)		13				64			64		12	
Link Speed (mph)		30				30			30		30	
Link Distance (ft)		509				544			542		555	
Travel Time (s)		11.6				12.4			12.3		12.6	
Confl. Peds. (#/hr)	3		3	3		3	40		5	5		40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Adj. Flow (vph)	22	153	13	61	121	64	3	155	64	92	166	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	0	0	246	0	0	222	0	0	274	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0				0			0		0	
Link Offset(ft)		0				0			0		0	
Crosswalk Width(ft)		10				10			10		10	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	80	391		80	391		80	391		80	391	
Trailing Detector (ft)	50	255		50	255		50	255		50	255	
Detector 1 Position(ft)	50	255		50	255		50	255		50	255	
Detector 1 Size(ft)	30	6		30	6		30	6		30	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA										
Protected Phases		8			4			6			2	
Permitted Phases	8			4	4		6	6		2	2	
Detector Phase	8	8		4	4		6	6		2	2	

Lanes, Volumes, Timings
5: Park Street & Pendleton Street

2014 PM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	32.0	32.0		32.0	32.0		33.0	33.0		33.0	33.0	
Total Split (%)	49.2%	49.2%		49.2%	49.2%		50.8%	50.8%		50.8%	50.8%	
Maximum Green (s)	26.0	26.0		26.0	26.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	6.0			6.0			6.0			6.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)		4.5			4.5			8.7			8.7	
Actuated g/C Ratio		0.20			0.20			0.39			0.39	
v/c Ratio		0.30			0.39			0.17			0.25	
Control Delay		8.3			7.7			5.3			7.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.3			7.7			5.3			7.1	
LOS		A			A			A			A	
Approach Delay		8.3			7.7			5.3			7.1	
Approach LOS		A			A			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 22.2

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 7.0

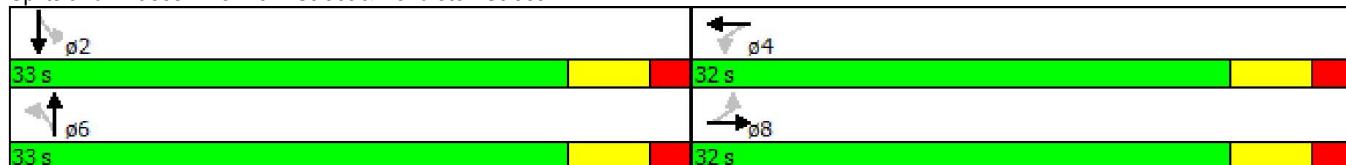
Intersection LOS: A

Intersection Capacity Utilization 55.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: Park Street & Pendleton Street



Lanes, Volumes, Timings
6: Assembly Street & Pendleton Street

2014 PM Existing Conditions

5/2/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	110	72	152	144	182	37	1057	101	104	1059	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	12	12	12
Storage Length (ft)	0	0	0	0		285	100		0	100		0
Storage Lanes	1	0	1			1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor	1.00	0.99		1.00		0.99	1.00		0.92	0.99	1.00	
Fr _t		0.941				0.850			0.850		0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	1318	0	1540	1621	1378	1540	4424	1198	1593	4354	0
Flt Permitted	0.628			0.559			0.136			0.136		
Satd. Flow (perm)	1016	1318	0	902	1621	1358	220	4424	1104	227	4354	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				50			146		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		544			540			535			555	
Travel Time (s)		12.4			12.3			12.2			12.6	
Confl. Peds. (#/hr)	3		7	7		3	6		39	39		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)		6	6						6		6	6
Adj. Flow (vph)	78	159	104	220	208	263	53	1527	146	150	1530	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	263	0	220	208	263	53	1527	146	150	1583	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.42	1.19	1.19	1.19	1.19	1.19	1.19	1.42	1.14	1.21	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	80	391		80	391	20	80	391	20	80	391	
Trailing Detector (ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Position(ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Size(ft)	30	6		30	6	20	30	6	20	30	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex								
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
6: Assembly Street & Pendleton Street

2014 PM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	30.0	30.0		30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	
Total Split (s)	30.0	30.0		30.0	30.0	30.0	35.0	35.0	35.0	35.0	35.0	
Total Split (%)	46.2%	46.2%		46.2%	46.2%	46.2%	53.8%	53.8%	53.8%	53.8%	53.8%	
Maximum Green (s)	24.0	24.0		24.0	24.0	24.0	29.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	Min	Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	16.0	16.0	16.0	16.0	16.0	
Pedestrian Calls (#/hr)	15	15		15	15	15	15	15	15	15	15	
Act Effect Green (s)	16.9	16.9		16.9	16.9	16.9	29.4	29.4	29.4	29.4	29.4	
Actuated g/C Ratio	0.29	0.29		0.29	0.29	0.29	0.50	0.50	0.50	0.50	0.50	
v/c Ratio	0.27	0.68		0.85	0.44	0.62	0.48	0.69	0.23	1.32	0.72	
Control Delay	17.3	26.6		47.4	19.3	20.3	32.9	14.5	3.4	218.7	15.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.3	26.6		47.4	19.3	20.3	32.9	14.5	3.4	218.7	15.1	
LOS	B	C		D	B	C	C	B	A	F	B	
Approach Delay		24.5			28.6			14.1			32.7	
Approach LOS		C			C			B			C	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 58.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.32

Intersection Signal Delay: 24.3

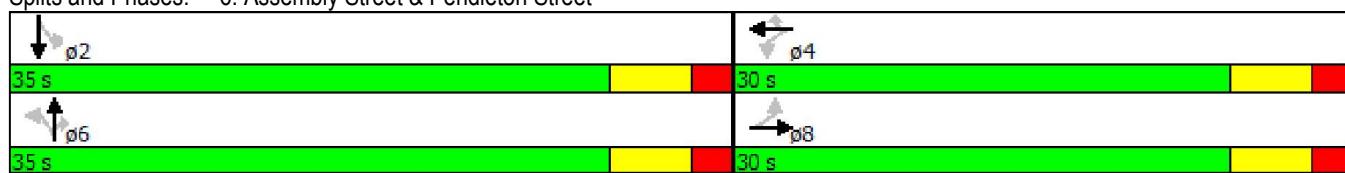
Intersection LOS: C

Intersection Capacity Utilization 86.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 6: Assembly Street & Pendleton Street



Lanes, Volumes, Timings
9: Park Street & Senate Street

2014 PM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	31	58	90	46	187	19	157	15	33	89	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Storage Length (ft)	0	0	150		0	0		0	0	0	0	0
Storage Lanes	0	0	1		0	0		0	0	0	0	0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor				0.99	0.99	0.98			1.00			0.99
Fr _t				0.943		0.879			0.988			0.962
Flt Protected				0.979		0.950			0.995			0.990
Satd. Flow (prot)	0	2637	0	1540	2477	0	0	2826	0	0	2719	0
Flt Permitted		0.723		0.612				0.915			0.857	
Satd. Flow (perm)	0	1940	0	985	2477	0	0	2595	0	0	2351	0
Right Turn on Red				Yes			Yes			Yes		Yes
Satd. Flow (RTOR)		84			270			17			59	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		522			541			555			543	
Travel Time (s)		11.9			12.3			12.6			12.3	
Confl. Peds. (#/hr)	15		9	9		15	23		7	7		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)		6	6		6	6		6	6		6	6
Adj. Flow (vph)	94	45	84	130	66	270	27	227	22	48	129	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	223	0	130	336	0	0	276	0	0	236	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	80	391		80	391		80	391		80	391	
Trailing Detector (ft)	50	255		50	255		50	255		50	255	
Detector 1 Position(ft)	50	255		50	255		50	255		50	255	
Detector 1 Size(ft)	30	6		30	6		30	6		30	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
9: Park Street & Senate Street

2014 PM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)				0.0		0.0		0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases			8			4			6			2
Permitted Phases	8				4			6			2	
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	33.0	33.0		33.0	33.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.8%	50.8%		50.8%	50.8%		49.2%	49.2%		49.2%	49.2%	
Maximum Green (s)	27.0	27.0		27.0	27.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0			6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	15	15		15	15		18	18		18	18	
Act Effect Green (s)	10.1		10.1	10.1				26.4			26.4	
Actuated g/C Ratio	0.21		0.21	0.21				0.54			0.54	
v/c Ratio	0.48		0.64	0.46				0.20			0.18	
Control Delay	13.6		31.4	6.2				7.1			5.9	
Queue Delay	0.0		0.0	0.0				0.0			0.0	
Total Delay	13.6		31.4	6.2				7.1			5.9	
LOS	B		C	A				A			A	
Approach Delay	13.6			13.3				7.1			5.9	
Approach LOS	B			B				A			A	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 48.6

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 10.5

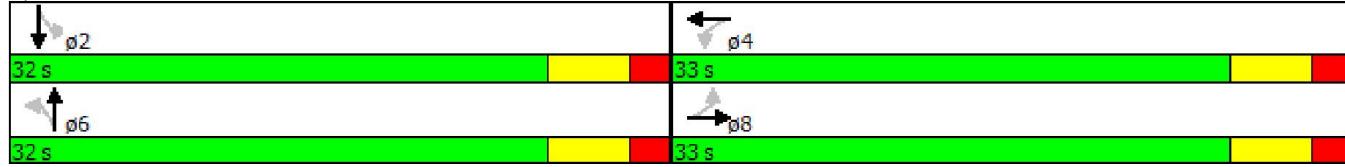
Intersection LOS: B

Intersection Capacity Utilization 76.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: Park Street & Senate Street



Lanes, Volumes, Timings
11: Assembly Street & Senate Street

2014 PM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	0	47	7	6	106	44	1315	0	0	1112	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	1		1	0		0	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor	0.98		0.98		0.97		1.00				1.00	
Fr _t			0.850		0.880						0.992	
Flt Protected	0.950				0.997		0.950					
Satd. Flow (prot)	1540	0	1198	0	1374	0	1386	4577	0	0	5527	0
Flt Permitted	0.730				0.997		0.136					
Satd. Flow (perm)	1159	0	1173	0	1374	0	198	4577	0	0	5527	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			50		3						23	
Link Speed (mph)			30		30			30			30	
Link Distance (ft)			541		401			555			534	
Travel Time (s)			12.3		9.1			12.6			12.1	
Confl. Peds. (#/hr)	32		12	12		32	16					16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)			6	6			6				6	6
Adj. Flow (vph)	64	0	68	10	9	153	64	1899	0	0	1606	91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	0	68	0	172	0	64	1899	0	0	1697	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)			22		22			12			12	
Link Offset(ft)			0		0			0			0	
Crosswalk Width(ft)			10		10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.42	1.19	1.19	1.19	1.36	1.14	1.14	1.14	1.19	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2		1	2			2	
Detector Template	Left		Right	Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	80		20	80	391		80	391			391	
Trailing Detector (ft)	50		0	50	255		50	255			255	
Detector 1 Position(ft)	50		0	50	255		50	255			255	
Detector 1 Size(ft)	30		20	30	6		30	6			6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					385		385				385	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
11: Assembly Street & Senate Street

2014 PM Existing Conditions

5/2/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	
Protected Phases					4			6			2	
Permitted Phases	8		8	4			6					
Detector Phase	8		8	4	4		6	6			2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
Minimum Split (s)	30.0		30.0	30.0	30.0		26.0	26.0			26.0	
Total Split (s)	30.0		30.0	30.0	30.0		35.0	35.0			35.0	
Total Split (%)	46.2%		46.2%	46.2%	46.2%		53.8%	53.8%			53.8%	
Maximum Green (s)	24.0		24.0	24.0	24.0		29.0	29.0			29.0	
Yellow Time (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0		6.0	6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	Min		Min	Min	Min		Max	Max			Max	
Walk Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Flash Dont Walk (s)	19.0		19.0	19.0	19.0		15.0	15.0			15.0	
Pedestrian Calls (#/hr)	15		15	15	15		15	15			15	
Act Effect Green (s)	10.2		10.2	10.2	10.2		29.5	29.5			29.5	
Actuated g/C Ratio	0.20		0.20	0.20	0.20		0.57	0.57			0.57	
v/c Ratio	0.28		0.25	0.63			0.57	0.73			0.54	
Control Delay	19.6		9.7	28.8			38.0	12.6			8.9	
Queue Delay	0.0		0.0	0.0			0.0	0.0			0.0	
Total Delay	19.6		9.7	28.8			38.0	12.6			8.9	
LOS	B		A	C			D	B			A	
Approach Delay				28.8				13.5			8.9	
Approach LOS				C				B			A	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 51.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 12.2

Intersection LOS: B

Intersection Capacity Utilization 73.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 11: Assembly Street & Senate Street



Appendix C 2017 Build Capacity Analyses

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	49	5	26	67	93	3	63	13	49	108	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.989				0.925			0.975		0.984	
Flt Protected		0.990				0.993			0.998		0.986	
Satd. Flow (prot)	0	3461	0	0	3228	0	0	3436	0	0	3426	0
Flt Permitted		0.843				0.900			0.932		0.851	
Satd. Flow (perm)	0	2947	0	0	2925	0	0	3208	0	0	2956	0
Right Turn on Red			Yes				Yes			Yes		Yes
Satd. Flow (RTOR)		7				134			19		24	
Link Speed (mph)		30				30			30		30	
Link Distance (ft)		509				544			542		555	
Travel Time (s)		11.6				12.4			12.3		12.6	
Confl. Peds. (#/hr)	2		4	4		2	11		1	1		11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Adj. Flow (vph)	20	71	7	38	97	134	4	91	19	71	156	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	269	0	0	114	0	0	254	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0				0			0		0	
Link Offset(ft)		0				0			0		0	
Crosswalk Width(ft)		10				10			10		10	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	80	391		80	391		80	391		80	391	
Trailing Detector (ft)	50	255		50	255		50	255		50	255	
Detector 1 Position(ft)	50	255		50	255		50	255		50	255	
Detector 1 Size(ft)	30	6		30	6		30	6		30	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0				0.0			0.0		0.0	
Turn Type	Perm	NA										
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Detector Phase	8	8		4	4		6	6		2	2	

Lanes, Volumes, Timings
5: Park Street & Pendleton Street

2017 AM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	32.0	32.0		32.0	32.0		33.0	33.0		33.0	33.0	
Total Split (%)	49.2%	49.2%		49.2%	49.2%		50.8%	50.8%		50.8%	50.8%	
Maximum Green (s)	26.0	26.0		26.0	26.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	6.0			6.0			6.0			6.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	4.4			4.4			4.9			4.9		
Actuated g/C Ratio	0.21			0.21			0.23			0.23		
v/c Ratio	0.16			0.38			0.15			0.36		
Control Delay	7.1			5.5			6.4			8.0		
Queue Delay	0.0			0.0			0.0			0.0		
Total Delay	7.1			5.5			6.4			8.0		
LOS	A			A			A			A		
Approach Delay	7.1			5.5			6.4			8.0		
Approach LOS	A			A			A			A		
Queue Length 50th (ft)	3			5			3			8		
Queue Length 95th (ft)	10			16			11			22		
Internal Link Dist (ft)	429			464			462			475		
Turn Bay Length (ft)												
Base Capacity (vph)	2947			2925			3208			2956		
Starvation Cap Reductn	0			0			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.03			0.09			0.04			0.09		

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 21.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 6.7

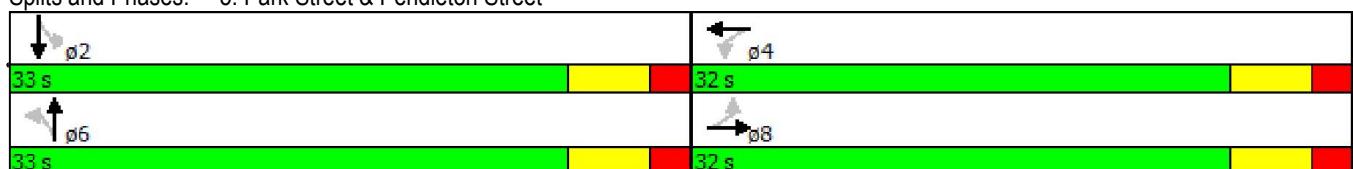
Intersection LOS: A

Intersection Capacity Utilization 37.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 5: Park Street & Pendleton Street



Lanes, Volumes, Timings

6: Assembly Street & Pendleton Street 2017 AM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑	↑	↑	↑↑↑	↑	↑	↑↑↑	
Volume (vph)	16	83	10	44	76	59	62	926	158	145	729	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	12	12	12
Storage Length (ft)	0		0	0		285	100		0	100		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor	1.00	1.00		0.99		0.98	1.00		0.97	1.00	1.00	
Fr _t		0.984				0.850			0.850		0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	1385	0	1540	1621	1378	1540	4424	1198	1593	4317	0
Flt Permitted	0.686			0.671			0.236			0.183		
Satd. Flow (perm)	1108	1385	0	1082	1621	1355	381	4424	1162	306	4317	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				50			228			27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		544			540			535			555	
Travel Time (s)		12.4			12.3			12.2			12.6	
Confl. Peds. (#/hr)	5		8	8		5	15		7	7		15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)		6	6						6		6	6
Adj. Flow (vph)	23	120	14	64	110	85	90	1338	228	209	1053	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	134	0	64	110	85	90	1338	228	209	1143	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.42	1.19	1.19	1.19	1.19	1.19	1.19	1.42	1.14	1.21	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	80	391		80	391	20	80	391	20	80	391	
Trailing Detector (ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Position(ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Size(ft)	30	6		30	6	20	30	6	20	30	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex								
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

6: Assembly Street & Pendleton Street 2017 AM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)				0.0		0.0		0.0				0.0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	Perm	NA
Protected Phases		8			4			6				2
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	6	6	6	2		2
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Minimum Split (s)	30.0	30.0		30.0	30.0	30.0	27.0	27.0	27.0	27.0		27.0
Total Split (s)	30.0	30.0		30.0	30.0	30.0	35.0	35.0	35.0	35.0		35.0
Total Split (%)	46.2%	46.2%		46.2%	46.2%	46.2%	53.8%	53.8%	53.8%	53.8%		53.8%
Maximum Green (s)	24.0	24.0		24.0	24.0	24.0	29.0	29.0	29.0	29.0		29.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	None		None	None	None	Min	Min	Min	Min		Min
Walk Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	16.0	16.0	16.0	16.0		16.0
Pedestrian Calls (#/hr)	15	15		15	15	15	15	15	15	15		15
Act Effect Green (s)	9.0	9.0		9.0	9.0	9.0	33.8	33.8	33.8	33.8		33.8
Actuated g/C Ratio	0.17	0.17		0.17	0.17	0.17	0.66	0.66	0.66	0.66		0.66
v/c Ratio	0.12	0.54		0.34	0.39	0.31	0.36	0.46	0.27	1.04		0.40
Control Delay	17.0	24.8		22.0	21.4	11.7	15.6	7.9	2.6	101.1		7.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	17.0	24.8		22.0	21.4	11.7	15.6	7.9	2.6	101.1		7.2
LOS	B	C		C	C	B	B	A	A	F		A
Approach Delay		23.6			18.3			7.6				21.7
Approach LOS		C			B			A				C
Queue Length 50th (ft)	6	33		17	29	9	10	62	0	~71		48
Queue Length 95th (ft)	19	70		41	60	34	#85	192	34	#189		154
Internal Link Dist (ft)		464			460			455				475
Turn Bay Length (ft)					285	100				100		
Base Capacity (vph)	523	659		510	765	665	249	2894	839	200		2834
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0		0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0		0
Reduced v/c Ratio	0.04	0.20		0.13	0.14	0.13	0.36	0.46	0.27	1.04		0.40

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 51.6

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 14.7

Intersection LOS: B

Lanes, Volumes, Timings

6: Assembly Street & Pendleton Street 2017 AM Build Condition

5/6/2014

Intersection Capacity Utilization 71.2%

ICU Level of Service C

Analysis Period (min) 15

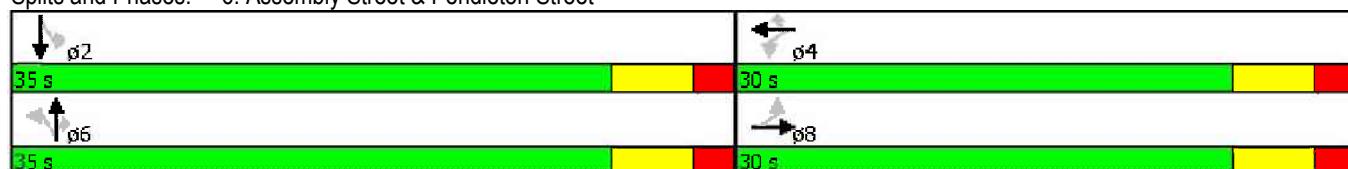
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Assembly Street & Pendleton Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	58	12	24	5	25	4	61	59	223	114	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Storage Length (ft)	0	0	0	150	0	0	0	0	0	0	0	0
Storage Lanes	0	0	0	1	0	0	0	0	0	0	0	0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor				1.00		1.00					1.00	
Fr _t				0.979		0.874					0.929	0.998
Flt Protected				0.991		0.950					0.998	0.968
Satd. Flow (prot)	0	2787	0	1540	2485	0	0	2652	0	0	2781	0
Flt Permitted		0.895		0.674				0.941			0.700	
Satd. Flow (perm)	0	2516	0	1090	2485	0	0	2500	0	0	2009	0
Right Turn on Red				Yes			Yes			Yes		Yes
Satd. Flow (RTOR)		17			36			85			3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		522			541			555			543	
Travel Time (s)		11.9			12.3			12.6			12.3	
Confl. Peds. (#/hr)	3		3	3		3	6		2	2		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)		6	6		6	6		6	6		6	6
Adj. Flow (vph)	22	84	17	35	7	36	6	88	85	322	165	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	123	0	35	43	0	0	179	0	0	494	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	80	391		80	391		80	391		80	391	
Trailing Detector (ft)	50	255		50	255		50	255		50	255	
Detector 1 Position(ft)	50	255		50	255		50	255		50	255	
Detector 1 Size(ft)	30	6		30	6		30	6		30	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)				0.0		0.0		0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases			8			4			6			2
Permitted Phases	8				4			6			2	
Detector Phase	8	8		4	4		6	6		2		2
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0		4.0
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0		26.0
Total Split (s)	33.0	33.0		33.0	33.0		32.0	32.0		32.0		32.0
Total Split (%)	50.8%	50.8%		50.8%	50.8%		49.2%	49.2%		49.2%		49.2%
Maximum Green (s)	27.0	27.0		27.0	27.0		26.0	26.0		26.0		26.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0		2.0
Lost Time Adjust (s)	0.0			0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0			6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		3.0
Recall Mode	None	None		None	None		Max	Max		Max		Max
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0		5.0
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0		15.0
Pedestrian Calls (#/hr)	15	15		15	15		18	18		18		18
Act Effect Green (s)	6.9		6.9	6.9				31.3			31.3	
Actuated g/C Ratio	0.15		0.15	0.15				0.66			0.66	
v/c Ratio	0.32		0.22	0.11				0.11			0.37	
Control Delay	16.7		19.1	7.8				3.7			7.3	
Queue Delay	0.0		0.0	0.0				0.0			0.0	
Total Delay	16.7		19.1	7.8				3.7			7.3	
LOS	B		B	A				A			A	
Approach Delay	16.7			12.8				3.7			7.3	
Approach LOS	B			B				A			A	
Queue Length 50th (ft)	13		8	1				3			24	
Queue Length 95th (ft)	28		25	9				24			102	
Internal Link Dist (ft)	442			461				475			463	
Turn Bay Length (ft)				150								
Base Capacity (vph)	1467		633	1457				1689			1335	
Starvation Cap Reductn	0		0	0				0			0	
Spillback Cap Reductn	0		0	0				0			0	
Storage Cap Reductn	0		0	0				0			0	
Reduced v/c Ratio	0.08		0.06	0.03				0.11			0.37	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 47.1

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.37

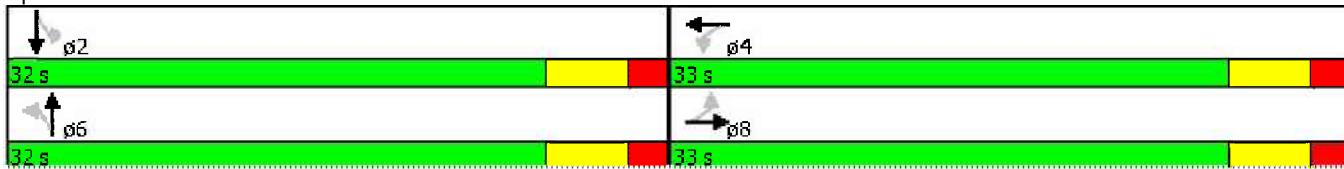
Intersection Signal Delay: 8.4

Intersection LOS: A

Intersection Capacity Utilization 58.9%
Analysis Period (min) 15

ICU Level of Service B

Splits and Phases: 9: Park Street & Senate Street



Lanes, Volumes, Timings

11: Assembly Street & Senate Street

2017 AM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	0	17	0	0	3	27	1114	0	0	807	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	1		1	0		0	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor	0.97		0.98		0.96		1.00				1.00	
Fr _t			0.850		0.865						0.993	
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1540	0	1198	0	1346	0	1386	4577	0	0	5534	0
Flt Permitted	0.755						0.202					
Satd. Flow (perm)	1189	0	1178	0	1346	0	294	4577	0	0	5534	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			50		50						19	
Link Speed (mph)			30		30			30			30	
Link Distance (ft)			541		401			555			534	
Travel Time (s)			12.3		9.1			12.6			12.1	
Confl. Peds. (#/hr)	35		6	6		35	15					15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)			6	6			6				6	6
Adj. Flow (vph)	30	0	25	0	0	4	39	1609	0	0	1166	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	0	25	0	4	0	39	1609	0	0	1222	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)			22		22			12			12	
Link Offset(ft)			0		0			0			0	
Crosswalk Width(ft)			10		10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.42	1.19	1.19	1.19	1.36	1.14	1.14	1.14	1.19	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2		1	2			2	
Detector Template	Left		Right	Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	80		20	80	391		80	391			391	
Trailing Detector (ft)	50		0	50	255		50	255			255	
Detector 1 Position(ft)	50		0	50	255		50	255			255	
Detector 1 Size(ft)	30		20	30	6		30	6			6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					385			385			385	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

11: Assembly Street & Senate Street

2017 AM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Perm		Perm		NA		Perm	NA			NA	
Protected Phases					4			6			2	
Permitted Phases	8		8	4			6					
Detector Phase	8		8	4	4		6	6			2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
Minimum Split (s)	30.0		30.0	30.0	30.0		26.0	26.0			26.0	
Total Split (s)	30.0		30.0	30.0	30.0		35.0	35.0			35.0	
Total Split (%)	46.2%		46.2%	46.2%	46.2%		53.8%	53.8%			53.8%	
Maximum Green (s)	24.0		24.0	24.0	24.0		29.0	29.0			29.0	
Yellow Time (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0	0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0	6.0			6.0	6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	Min		Min	Min	Min		Max	Max			Max	
Walk Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Flash Dont Walk (s)	19.0		19.0	19.0	19.0		15.0	15.0			15.0	
Pedestrian Calls (#/hr)	15		15	15	15		15	15			15	
Act Effect Green (s)	8.2		8.2	8.2			29.6	29.6			29.6	
Actuated g/C Ratio	0.16		0.16		0.16		0.59	0.59			0.59	
v/c Ratio	0.15		0.11		0.02		0.23	0.59			0.37	
Control Delay	18.0		3.0		0.0		12.1	9.1			6.8	
Queue Delay	0.0		0.0		0.0		0.0	0.0			0.0	
Total Delay	18.0		3.0		0.0		12.1	9.1			6.8	
LOS	B		A		A		B	A			A	
Approach Delay					0.0			9.1			6.8	
Approach LOS						A		A			A	
Queue Length 50th (ft)	8		0		0		4	72			35	
Queue Length 95th (ft)	23		7		0		34	246			121	
Internal Link Dist (ft)		461			321			475			454	
Turn Bay Length (ft)						100						
Base Capacity (vph)	581		602		684		173	2706			3279	
Starvation Cap Reductn	0		0		0		0	0			0	
Spillback Cap Reductn	0		0		0		0	0			0	
Storage Cap Reductn	0		0		0		0	0			0	
Reduced v/c Ratio	0.05		0.04		0.01		0.23	0.59			0.37	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 50

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 8.2

Intersection LOS: A

Lanes, Volumes, Timings

11: Assembly Street & Senate Street

2017 AM Build Condition

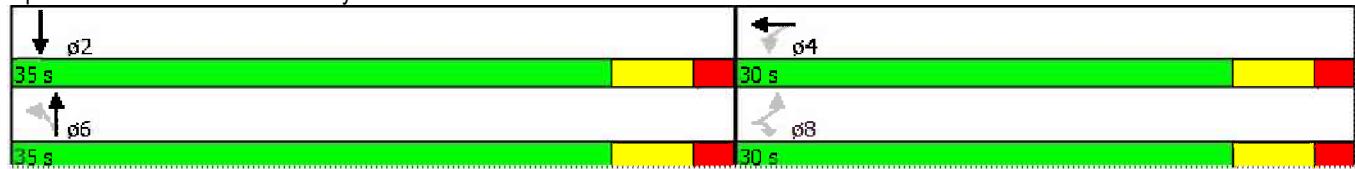
5/6/2014

Intersection Capacity Utilization 55.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 11: Assembly Street & Senate Street



Lanes, Volumes, Timings
5: Park Street & Pendleton Street

2017 PM Build Condition

5/6/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	111	9	44	88	74	2	144	46	82	131	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.990				0.946			0.964		0.991	
Flt Protected		0.994				0.989			0.999		0.982	
Satd. Flow (prot)	0	3479	0	0	3294	0	0	3395	0	0	3434	0
Flt Permitted		0.871				0.852			0.946		0.776	
Satd. Flow (perm)	0	3048	0	0	2836	0	0	3214	0	0	2710	0
Right Turn on Red			Yes				Yes			Yes		Yes
Satd. Flow (RTOR)		13				107			66		12	
Link Speed (mph)		30				30			30		30	
Link Distance (ft)		509				544			542		555	
Travel Time (s)		11.6				12.4			12.3		12.6	
Confl. Peds. (#/hr)	3		3	3		3	40		5	5		40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Adj. Flow (vph)	26	160	13	64	127	107	3	208	66	118	189	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	199	0	0	298	0	0	277	0	0	326	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0				0			0		0	
Link Offset(ft)		0				0			0		0	
Crosswalk Width(ft)		10				10			10		10	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	80	391		80	391		80	391		80	391	
Trailing Detector (ft)	50	255		50	255		50	255		50	255	
Detector 1 Position(ft)	50	255		50	255		50	255		50	255	
Detector 1 Size(ft)	30	6		30	6		30	6		30	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA										
Protected Phases		8			4			6			2	
Permitted Phases	8			4	4		6	6		2	2	
Detector Phase	8	8		4	4		6	6		2	2	

Lanes, Volumes, Timings
5: Park Street & Pendleton Street

2017 PM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	32.0	32.0		32.0	32.0		33.0	33.0		33.0	33.0	
Total Split (%)	49.2%	49.2%		49.2%	49.2%		50.8%	50.8%		50.8%	50.8%	
Maximum Green (s)	26.0	26.0		26.0	26.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	6.0			6.0			6.0			6.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	4.8			4.8			5.6			5.6		
Actuated g/C Ratio	0.21			0.21			0.25			0.25		
v/c Ratio	0.30			0.43			0.33			0.48		
Control Delay	8.6			7.3			6.4			9.6		
Queue Delay	0.0			0.0			0.0			0.0		
Total Delay	8.6			7.3			6.4			9.6		
LOS	A			A			A			A		
Approach Delay	8.6			7.3			6.4			9.6		
Approach LOS	A			A			A			A		
Queue Length 50th (ft)	7			8			8			13		
Queue Length 95th (ft)	22			25			23			33		
Internal Link Dist (ft)	429			464			462			475		
Turn Bay Length (ft)												
Base Capacity (vph)	2995			2788			3181			2682		
Starvation Cap Reductn	0			0			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.07			0.11			0.09			0.12		

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 22.6

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 8.0

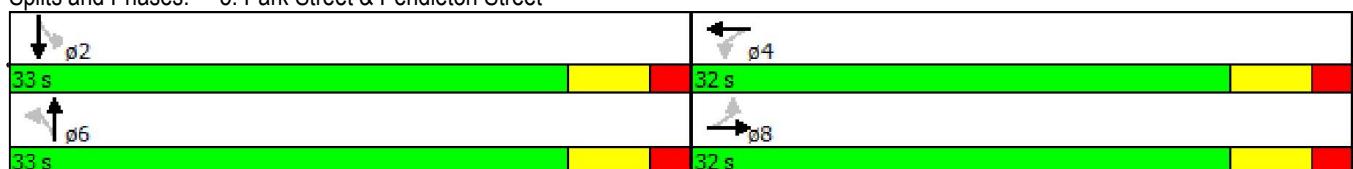
Intersection LOS: A

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: Park Street & Pendleton Street



Lanes, Volumes, Timings

6: Assembly Street & Pendleton Street 2017 PM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑	↑	↑↑↑	↑	↑	↑↑↑	
Volume (vph)	57	130	75	159	166	191	52	1105	106	114	1129	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	12	12	12
Storage Length (ft)	0	0	0	0		285	100		0	100		0
Storage Lanes	1	0	1			1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor	1.00	0.99		1.00		0.99	1.00		0.92	1.00	1.00	
Fr _t		0.945				0.850			0.850		0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	1324	0	1540	1621	1378	1540	4424	1198	1593	4354	0
Flt Permitted	0.598			0.513			0.137			0.137		
Satd. Flow (perm)	967	1324	0	828	1621	1358	222	4424	1104	229	4354	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				50			153		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		544			540			535			555	
Travel Time (s)		12.4			12.3			12.2			12.6	
Confl. Peds. (#/hr)	3		7	7		3	6		39	39		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)		6	6						6		6	6
Adj. Flow (vph)	82	188	108	230	240	276	75	1596	153	165	1631	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	296	0	230	240	276	75	1596	153	165	1687	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.42	1.19	1.19	1.19	1.19	1.19	1.19	1.42	1.14	1.21	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	80	391		80	391	20	80	391	20	80	391	
Trailing Detector (ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Position(ft)	50	255		50	255	0	50	255	0	50	255	
Detector 1 Size(ft)	30	6		30	6	20	30	6	20	30	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex								
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

6: Assembly Street & Pendleton Street 2017 PM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	30.0	30.0		30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	
Total Split (s)	30.0	30.0		30.0	30.0	30.0	35.0	35.0	35.0	35.0	35.0	
Total Split (%)	46.2%	46.2%		46.2%	46.2%	46.2%	53.8%	53.8%	53.8%	53.8%	53.8%	
Maximum Green (s)	24.0	24.0		24.0	24.0	24.0	29.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	Min	Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	16.0	16.0	16.0	16.0	16.0	
Pedestrian Calls (#/hr)	15	15		15	15	15	15	15	15	15	15	
Act Effect Green (s)	18.7	18.7		18.7	18.7	18.7	29.3	29.3	29.3	29.3	29.3	
Actuated g/C Ratio	0.31	0.31		0.31	0.31	0.31	0.49	0.49	0.49	0.49	0.49	
v/c Ratio	0.27	0.71		0.89	0.48	0.61	0.69	0.74	0.25	1.49	0.79	
Control Delay	17.3	27.6		56.3	19.5	19.8	55.0	16.2	3.4	283.5	18.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.3	27.6		56.3	19.5	19.8	55.0	16.2	3.4	283.5	18.0	
LOS	B	C		E	B	B	E	B	A	F	B	
Approach Delay		25.4			31.0			16.8			41.6	
Approach LOS		C			C			B			D	
Queue Length 50th (ft)	22	90		77	69	66	23	183	0	~94	201	
Queue Length 95th (ft)	52	166		#188	124	133	#96	249	28	#168	#280	
Internal Link Dist (ft)		464			460			455			475	
Turn Bay Length (ft)					285	100			100			
Base Capacity (vph)	390	537		333	653	577	108	2155	616	111	2126	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.21	0.55		0.69	0.37	0.48	0.69	0.74	0.25	1.49	0.79	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 60.2

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.49

Intersection Signal Delay: 29.2

Intersection LOS: C

Lanes, Volumes, Timings

6: Assembly Street & Pendleton Street 2017 PM Build Condition

5/6/2014

Intersection Capacity Utilization 90.1%

ICU Level of Service E

Analysis Period (min) 15

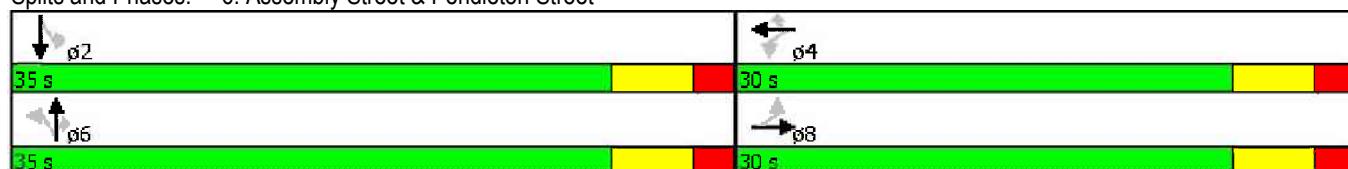
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Assembly Street & Pendleton Street



	↑	→	↓	↗	↖	↙	↖	↗	↑	↓	↗	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	68	33	62	94	48	195	21	174	15	35	111	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor				0.99	0.99	0.98			1.00			0.99
Fr _t				0.943		0.879			0.989			0.966
Flt Protected				0.980		0.950			0.995			0.991
Satd. Flow (prot)	0	2640	0	1540	2477	0	0	2829	0	0	2735	0
Flt Permitted		0.720		0.605				0.909			0.856	
Satd. Flow (perm)	0	1932	0	974	2477	0	0	2581	0	0	2360	0
Right Turn on Red				Yes			Yes			Yes		Yes
Satd. Flow (RTOR)		90			282			15			62	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		522			541			555			543	
Travel Time (s)		11.9			12.3			12.6			12.3	
Confl. Peds. (#/hr)	15		9	9		15	23		7	7		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)		6	6		6	6		6	6		6	6
Adj. Flow (vph)	98	48	90	136	69	282	30	251	22	51	160	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	236	0	136	351	0	0	303	0	0	273	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		10			10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19	1.19	1.30	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	80	391		80	391		80	391		80	391	
Trailing Detector (ft)	50	255		50	255		50	255		50	255	
Detector 1 Position(ft)	50	255		50	255		50	255		50	255	
Detector 1 Size(ft)	30	6		30	6		30	6		30	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		385			385			385			385	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA										
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	33.0	33.0		33.0	33.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.8%	50.8%		50.8%	50.8%		49.2%	49.2%		49.2%	49.2%	
Maximum Green (s)	27.0	27.0		27.0	27.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0			6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	15	15		15	15		18	18		18	18	
Act Effect Green (s)	10.3			10.3	10.3			26.3			26.3	
Actuated g/C Ratio	0.21			0.21	0.21			0.54			0.54	
v/c Ratio	0.49			0.66	0.47			0.22			0.21	
Control Delay	13.6			32.7	6.2			7.4			6.2	
Queue Delay	0.0			0.0	0.0			0.0			0.0	
Total Delay	13.6			32.7	6.2			7.4			6.2	
LOS	B			C	A			A			A	
Approach Delay	13.6				13.6			7.4			6.2	
Approach LOS	B				B			A			A	
Queue Length 50th (ft)	18			35	8			18			13	
Queue Length 95th (ft)	42			78	33			53			42	
Internal Link Dist (ft)	442				461			475			463	
Turn Bay Length (ft)					150							
Base Capacity (vph)	1121			545	1511			1398			1301	
Starvation Cap Reductn	0			0	0			0			0	
Spillback Cap Reductn	0			0	0			0			0	
Storage Cap Reductn	0			0	0			0			0	
Reduced v/c Ratio	0.21			0.25	0.23			0.22			0.21	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 48.8

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.66

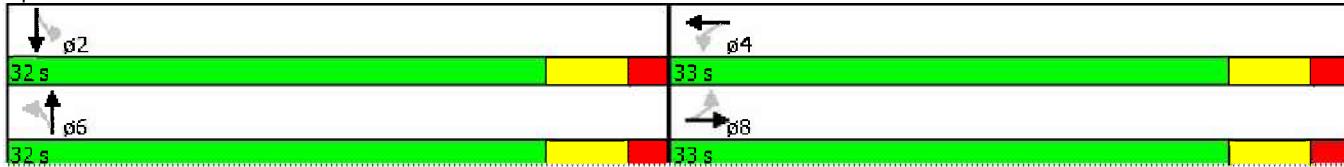
Intersection Signal Delay: 10.6

Intersection LOS: B

Intersection Capacity Utilization 77.1%
Analysis Period (min) 15

ICU Level of Service D

Splits and Phases: 9: Park Street & Senate Street



Lanes, Volumes, Timings

11: Assembly Street & Senate Street

2017 PM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	→	↓	←	↖	↙	↑	↑↑↑		↑↑↑	↑↑↑	
Volume (vph)	46	0	49	7	6	111	46	1374	0	0	1168	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	1		1	0		0	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor	0.98		0.98		0.97		1.00				1.00	
Fr _t			0.850		0.879						0.992	
Flt Protected	0.950				0.997			0.950				
Satd. Flow (prot)	1540	0	1198	0	1373	0	1386	4577	0	0	5527	0
Flt Permitted	0.711				0.997		0.136					
Satd. Flow (perm)	1130	0	1173	0	1372	0	198	4577	0	0	5527	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			50		2						22	
Link Speed (mph)			30		30			30			30	
Link Distance (ft)			541		401			555			534	
Travel Time (s)			12.3		9.1			12.6			12.1	
Confl. Peds. (#/hr)	32		12	12		32	16					16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%
Parking (#/hr)			6	6			6				6	6
Adj. Flow (vph)	66	0	71	10	9	160	66	1985	0	0	1687	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	0	71	0	179	0	66	1985	0	0	1782	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)			22		22			12			12	
Link Offset(ft)			0		0			0			0	
Crosswalk Width(ft)			10		10			10			10	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.42	1.19	1.19	1.19	1.36	1.14	1.14	1.14	1.19	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	2		1	2			2	
Detector Template	Left		Right	Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	80		20	80	391		80	391			391	
Trailing Detector (ft)	50		0	50	255		50	255			255	
Detector 1 Position(ft)	50		0	50	255		50	255			255	
Detector 1 Size(ft)	30		20	30	6		30	6			6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					385			385			385	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

11: Assembly Street & Senate Street

2017 PM Build Condition

5/6/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	
Protected Phases					4			6			2	
Permitted Phases	8		8	4			6					
Detector Phase	8		8	4	4		6	6			2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
Minimum Split (s)	30.0		30.0	30.0	30.0		26.0	26.0			26.0	
Total Split (s)	30.0		30.0	30.0	30.0		35.0	35.0			35.0	
Total Split (%)	46.2%		46.2%	46.2%	46.2%		53.8%	53.8%			53.8%	
Maximum Green (s)	24.0		24.0	24.0	24.0		29.0	29.0			29.0	
Yellow Time (s)	4.0		4.0	4.0	4.0		4.0	4.0			4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)	0.0		0.0	0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0	6.0			6.0	6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	Min		Min	Min	Min		Max	Max			Max	
Walk Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Flash Dont Walk (s)	19.0		19.0	19.0	19.0		15.0	15.0			15.0	
Pedestrian Calls (#/hr)	15		15	15	15		15	15			15	
Act Effect Green (s)	10.4		10.4	10.4	10.4		29.5	29.5			29.5	
Actuated g/C Ratio	0.20		0.20	0.20	0.20		0.57	0.57			0.57	
v/c Ratio	0.29		0.26	0.65			0.59	0.77			0.57	
Control Delay	19.8		10.0	29.6			40.1	13.7			9.2	
Queue Delay	0.0		0.0	0.0			0.0	0.0			0.0	
Total Delay	19.8		10.0	29.6			40.1	13.7			9.2	
LOS	B		A	C			D	B			A	
Approach Delay				29.6				14.5			9.3	
Approach LOS				C				B			A	
Queue Length 50th (ft)	17		5	49			10	132			77	
Queue Length 95th (ft)	42		29	96			#89	#390			198	
Internal Link Dist (ft)	461			321				475			454	
Turn Bay Length (ft)						100						
Base Capacity (vph)	529		576	644			112	2592			3139	
Starvation Cap Reductn	0		0	0			0	0			0	
Spillback Cap Reductn	0		0	0			0	0			0	
Storage Cap Reductn	0		0	0			0	0			0	
Reduced v/c Ratio	0.12		0.12	0.28			0.59	0.77			0.57	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 52

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 12.9

Intersection LOS: B

Lanes, Volumes, Timings

11: Assembly Street & Senate Street

2017 PM Build Condition

5/6/2014

Intersection Capacity Utilization 76.3%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Assembly Street & Senate Street

